



# Emergency Health Services Output Display to the services of the services of

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IN



#### INTRODUCTION

Our world is often too much ahead of us. Professionals who would keep up with their field need more than 24 hours just to scan the spectrum and still accomplish a day's work.

To help solve the research problem for emergency health and medical planners, this Emergency Health Services DIGEST will be published periodically by the Public Health Service, Division of Emergency Health Services. Each issue will contain summaries of selected current articles on pertinent programs from professional journals and other periodicals and a cumulative index.

The original source is given with each summary and articles which are available in reprint form from the Division of Emergency Health Services are marked with an asterisk. Single copies of these reprints should be requested from:

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# EMERGENCY HEALTH PROGRAMING AND TRAINING

#### HOSPITAL

 HOSPITAL RESERVE DISASTER INVENTORY, An Essential to Disaster Planning

Allums F. Smith

20014

American Journal of Hospital Pharmacy, Vol. 25, Oct. 1968, pp. 573-74 4630 Montgomery Ave., Bethesda, Md.

The assistant director of the Public Health Service Division of Health Mobilization [now Division of Emergency Health Services] describes the Division's Hospital Reserve Disaster Inventory program which places backup supplies of critical medical items in community hospitals for use in emergencies.

A 30-day supply of these items—individually listed in an appendix—is available without charge providing the hospital agrees to develop and maintain plans for their use in a disaster; to maintain the supply at the level furnished, without reducing the inventory of the same or similar items normally kept on hand by the hospital; and to rotate the items where possible to avoid losses from deterioration or expiration of shelf life.

The article also outlines the placement of Packaged Disaster Hospitals and Natural Disaster Hospitals in areas susceptible to hurricanes and tornadoes, or deemed likely to serve large numbers of casualties in the event of a major natural disaster or national emergency.

HANDLING A LARGE INFLUX OF PATIENTS IN A DISASTER SITUATION

Richard H. Malone; Robert O'Conner, Jr.

Hospitals-J.A.H.A., Vol. 42, Feb. 16, 1968, pp. 67-70

American Hospital Assn., 840 N. Lake Shore Dr., Chicago, Ill. 60611

The administrator and an assistant of Hinds General Hospital in Jackson, Miss., discuss disaster planning in the light of their experiences when a tornado struck late in the afternoon within a mile of their hospital, which had been open only 4 months.

In the first 30 minutes after the tornado struck, 30 victims were brought in. Other hospitals were alerted to receive the less seriously injured. Transportation problems arose because most victims were brought in by neighbors and friends who were anxious for immediate care in the nearest hospital, not one on the other side of town. An improvised security system using volunteers proved that only uniform personnel can handle such a situ-

ation. By the end of the first hour, the staffing problem became one of too much help. The traffic flow to X-ray became a problem because of the numerous head and back injuries. Triage-established by a GP and pathologist-was instructed to route only serious cases; those in fairly good condition were sent to patient areas with instruction for later X-ray, When problems with parking and looting of cars were reported, Boy Scouts on standby were sent to help. At 10:30 p.m. the patient flow stopped abruptly. Eighty-five patients were seen; many others were treated, but not recorded, and 35 were admitted.

At a critique, attended by all physicians, it was agreed that:

- The area designated for less critically injured should be rechecked to ascertain changing conditions.
- 2. The bottleneck in X-ray was caused by film processing.
- Improved communications between hospital and disaster areas needed.
   A disaster plan must provide for:
- External Transportation.—Many victims wil arrive in private cars. Transportation to other hospitals will be needed.
- Internal Transportation.—Acute problems can develop, depending upon numbers of casualties and workable elevators.
- 3. Identifying and Sorting Patients.— Sorting is the key to the management of mass casualties, for it is directed toward establishing criteria for treatment priorities. Tagging each patient is essential and clerical teams should work along with the triage physician.
- Traffic Flow.—To avoid congestion and confusion, much thought should be given to hospital traffic flow pat-

- terns. Minor treatment areas should be well removed from major treatment and morgue areas. Discreet handling of fatalities will avert hysteria.
- Treatment Priorities.—Plans must be kept flexible to fit types of casualties received. The U.S. Army suggests treatment categories:
  - a. Minimal treatment for small lacerations, contusions, closed fractures of small bones.
  - Immediate treatment for hemorrhage from accessible site, sucking chest wounds, open fractures, respiratory obstruction and distress.
  - c. Delayed treatment for moderate lacerations without bleeding, closed fractures of major bones, second degree burns of 20 to 40 percent of body surface.
  - d. Indicated treatment for those who will require extensive care after first aid.
- 6. Staffing.—To insure around the clock coverage, do not use all available talent during the first excitement. The disaster plan should leave no doubt as to the persons responsible for calling employees and staff for duty.
- 7. Assigning Physicians.—It is not uncommon to find the same physician assigned to several hospitals, to civil defense, Red Cross, and other agencies, leaving disaster duty to his personal choice. All assignments must be coordinated with a central group, often the local medical society which maintains a roster of physicians. Preassignment of physicians has disadvantages: (1) It is difficult to predict where majority of medical staff will be needed; (2) in the interest of speed the first to arrive on duty should go to the most critical area.

## EXPANDING THE EMERGENCY DEPARTMENT

J. Cuthbert Owens, M.D.

JAMA, Vol. 203, Jan. 22, 1968, pp. 279-82

American Medical Assn., 535 N. Dearborn St., Chicago, Ill. 60610.

To insure prompt and practical expansion of emergency department facilities and personnel during disaster, efficient organization and quality care is necessary on a daily basis. Most deficiencies in mass casualty care arise when there is a lack of understanding of priority principles in emergency medical services and questionable reliance upon improvisation to bring order out of chaos.

#### Recommendations for Expansion Outside Hospital

- Emergency department medical and nursing personnel must accept more responsibility for training and supervising rescue personnel and "first aiders."
- Ambulance services should have medical advisors and hospital connections.
- An effective daily medical or hospital communication system with central emergency control.
- Identification devices to denote location of hospitals and other emergency medical care facilities.
- Security and traffic control for emergency vehicles and patients.

#### Recommendations for Expansion Within Hospital

- 1. Frequent review and updating of hospital disaster plans.
- 2. Daily outpatient and emergency

- patient sorting expanded for mass casualty triage procedures.
- Architectural plans for new and renovated buildings should allow for expanding emergency services on ground floor.
- 4. Personnel emergency call system carried out from employees' homes.
- Areas for press, police, and civic officials allocated near administration offices.
- Lounge or dining room space for care of relatives and compiling casualty list by Red Cross.
- A special "trouble shooter" and communicator should be among the emergency assignments.
- 8. Stocking of emergency supplies and identifying resupply sources.
- Two-way radio, paging and other communications equipment to augment usual internal lines.

#### \*"PACKAGED" HOSPITALS MEAN NEW TASKS FOR PHARMACY MANAGEMENT

James D. Snyder, м.s.

Hospital Formulary Management, Vol. 3, June 1968, pp. 29–31

Clissold Publishing Co., 105 West Adams St., Chicago, Ill. 60603

A report on portable emergency hospitals, designed by the Public Health Service and placed under operational control of community hospitals by the Division of Health Mobilization [now the Division of Emergency Health Services], and the management of the emergency drug inventories by hospital pharmacists.

Three types of units, all with pharmaceutical supplies, are now available to hospitals: (1) Packaged Disaster Hospital, enough equipment and supplies to set up and run a 200-cot hospital for 30 days; (2) Hospital Reserve Disaster Inventory, a 30-day backup inventory of medicines and supplies placed on community hospital shelves; and (3) Natural Disaster Hospital, a 50-cot unit for initial emergency medical care of up to 300 people. The contents and use of these units are outlined as well as the responsibilities of community hospitals which contract for them.

The chief pharmacist and/or the Pharmacy and Therapeutic Committee plays a key role in drug storage, maintenance and administration. Specific duties:

- Establishing liaison in planning operational policies.
- Inventory management, including rotation of emergency supplies with normal inventory to insure use before shelf life expires. (Table of pharmaceuticals gives quantity and shelf life.)
- Narcotic procurement, not supplied in emergency units.
- Record keeping to control inventories during emergency.
- Selection of personnel predisaster for 24-hour emergency staffing.
- Training personnel predisaster in emergency contingencies and duties.

#### PURCHASING DEPARTMENT PLAYS IMPORTANT ROLE IN DISASTER PLAN

Joseph L. Leydon

Modern Hospital, Vol. 109, Dec. 1967, p. 56

McGraw-Hill Publications, 1050 Merchandise Mart, Chicago, Ill. 60654 The director of purchasing for Yale-New Haven Hospital suggests a utilization plan for disaster, adaptable to any size department, that should be known, understood and agreed upon by all staff of hospital purchasing, stores and receiving departments.

- List names and telephone numbers of all purchasing staff—copies to be kept in members' homes, one with switchboard and one with administration.
- On emergency duty, purchasing agent or assistant decides if on-hand supplies can meet need and prepare to issue them.
- Since it is impossible and uneconomical to stock all items needed for every possible disaster, purchasing agent must survey all potential supply sources and all methods of possible transportation.
- All distributors, warehouses, and manufacturers within 2 hours' highway travel time from hospital should be asked to list:
  - a. Name and telephone number of person authorized to ship after hours.
  - b. Name and number of at least one alternate.
  - c. Types of supplies carried in quantity.
  - d. Emergency transportation available, if any.
- List of emergency suppliers should be kept in homes of all purchasing staff, so supply shipment can be started whether or not staff can get to hospital.
- Food, textiles and building materials can be obtained from disaster relief organizations.
- If receiving area is to be used as emergency morgue, emergency receiving area must be planned.

## HOW MUCH EMERGENCY POWER SHOULD A HOSPITAL PLAN?

James M. Daschbach; Gregory R. Gillen; Brian J. Smyth; Donald S. Woessner

Hospitals, J.A.H.A., Vol. 42, June 1, 1968, pp. 132-38

840 N. Lake Shore Dr., Chicago, Ill. 60611

Crucial decisions that must be made by hospital administrators in planning an emergency electrical power system are presented in this study made by the assistant professor of industrial engineering of the University of Notre Dame.

Many hospitals have adopted permanent two-feeder service for power continuity (described with diagram). Emergency generator plants vary in size and features from 25-kw. units to 1000-kw. units with sophisticated switching and transfer devices. The trend in most economy minded hospitals is a system which carries 50 or even 75 percent of the normal load. An intensive care unit also may require tandem emergency generators in case one fails to function properly. A mobile generator may be needed to supply power for treatment of patients who have to be transferred from the normal power source in case of fire, or other emergency.

#### Prime considerations

- Fuel.—Liquid fuel should be stored in an underground tank equipped with an adequate breather system.
- Instrumentation.—The generator system should include a log time indicator, voltmeter, oil pressure gauge, water temperature gauge, and a frequency meter. There should be a

- means of adjusting the voltage through a rheostat and a load ammeter to indicate the degree of loading.
- 3. Installation.—The generator location must take into account the potential transmission losses within the complex of the hospital buildings. Evaluate the desirability of one large unit versus two or more smaller ones.
- Elevators.—It is not generally feasible to have the emergency system operate more than one elevator at a time (about 38 kw.).
- 5. Sprinkler System.—All fire fighting and sprinkler system apparatus must be maintained during a power failure. One solution is an automatic transfer switch to switch out the main ventilator motors at the fire alarm and switch on the sprinkler pump, thereby also keeping smoke from circulating through the hospital.
- 6. Critical Light.—Operating and delivery rooms must have light at all times. Even the 10 seconds it often takes to switch to standby power may cause a crisis. The hospital can install simple, inexpensive rechargable battery units to insure continuous light in strategic locations (illustrated).
- 7. Anticipated Growth.—It is estimated that power requirements increase about 10 percent annually. The administration should seriously consider purchase of double, or even triple, the immediately required capacity of control boxes, conduit, and power lines to reduce the frequency of modification or installation of new parallel equipment routing.
- Cost.—A rough estimate for emergency power systems of 100 kw. and up is \$100 per kw., including equipment and installation.

\*THE "PREDICTIVE" APPROACH TO DISASTER PLANNING— HOW IT FAILED

William C. Richwagen

Hospitals—J.A.H.A. Vol. 41, Aug. 16, 1967, pp. 48-51 840 N. Lake Shore Dr., Chicago, Ill. 60611

Many hospital disaster plans are based on situation predictions and prescribed reactions to meet "logical" or "known" disasters.

An experience of the 263-bed Mary Hitchcock Memorial Hospital in Hanover, N.H., related by the assistant administrator, points out where such a plan can fail in an "unpredictable" disaster.

On a summer Saturday afternoonwhen the hospital was lightly staffedfood poisoning felled 91 out-of-towners attending a football game. The first patient arrived in shock; house physicians, suspecting poisoning, immediately notified the Poison Information Center. Within a half-hour five more emergencies arrived in the same condition. There was no way of knowing how many more might become affected, so phone calls were made immediately to the triage officer and on-call assistant administrator. By the time they reached the hospital 16 food poisoning cases were being treated and reports were that many more victims would arrive.

Emergency duty calls revealed that the administrator, associate, and disaster chairman were out of town and key administrative, medical and nursing personnel were away for the afternoon.

Nurses completing duty at 3 o'clock were sent to the emergency room. Kitch-

en workers set up stretchers and litters in the waiting area; central sterile supply personnel volunteered as nurse assistants; technicians, ward clerks, and orderlies procured vital drugs, other supplies and equipment; student nurses left classes to assist. In 5 hours the hospital cared for 89 emergencies, including 20 routine cases. It was determined later that a large number of sandwiches in catered box lunches were contaminated with staphylococcus bacteria causing the poisoning.

The hospital's 250-page disaster plan took every department function and individual into consideration, but action specifications were too complex for the needs. Services deemed critical in the plan were not critical: surgery was unnecessary, X-rays were not needed, emergency supplies were inappropriate, laboratory work was minimal. Absent key personnel greatly hampered flow of supplies and made it impossible to carry out special assignments outlined in the plan. There was no control center and most emergency communications were carried out as spontaneous reactions to help.

From this experience the hospital found six questions that hospitals should consider essential for their disaster plans:

- 1. Can your plan be applied to fit any emergency?
- 2. Is the plan so voluminous and detailed as to be impractical in actual emergency?
- 3. Does the plan depend solely upon controls and responsibilities prearranged and tested in drills?
- 4. Can the plan adjust when disaster comes in an unusual time?
- 5. Does the plan depend upon telephone communications to obtain personnel?
- 6. Is the plan single-phased on a "go" or "no-go" basis?

Using those questions, Mary Hitchcock Memorial Hospital made four major changes:

- An abbreviated outline lists disaster duties, responsibilities and equipment location by function—not individuals or departments.
- Department heads and section chiefs are oriented in availability and location of disaster supplies and equipment.
- A communications program has been designed to perfect disaster control command headquarters for assignments, communication, feedback, and situation evaluation.
- Disaster planning is incorporated into operating procedures; emergency listing of personnel appears in the telephone index, a "disaster closet" is established and control center has been allocated.

#### COMMUNITY

\*A COMMUNITY DISASTER EXER-CISE IN HARTFORD, CONNECTI-CUT

Leonard F. Menczer, D.D.S, M.P.H.

Public Health Reports, Vol. 83, Apr. 1968, pp. 288-94

Public Health Service, Lee Bldg., 6935 Wisconsin Ave., Chevy Chase, Md. 20015

The disaster coordinator of the Hartford health department describes a 1967 exercise which showed that the city was not properly prepared to handle a disaster.

Plans were made in 6 monthly meetings of participating agencies which included city and State health departments, council of hospitals, Red Cross chapter, county medical association, civil defense agency, ambulance association, and city fire and police departments. Responsibilities were defined, but overall leadership and many other problems discussed were never resolved. Twenty-six observers were appointed to evaluate the exercise and the State educational television station video-taped the exercise. This graphic evaluation proved more meaningful than the observers' critique.

The exercise simulated a boiler explosion, accompanied by fire and partial collapse of the building. Sixty-four casualties were made up with multiple compound fractures, extensive second- and third-degree burns and large puncture wounds.

Verbal and written reports were given 10 days after the exercise and the videotape was viewed. The following inadequacies were observed:

- No medical authority at the disaster scene to make decisions on treating and transporting patients and to determine extent of injuries for hospital notification.
- No recognized leader to coordinate participating services and agencies.
- Poor handling of injured by police and fire personnel.
- 4. Ambulance litters not interchangeable between vehicles. Standard field stretchers too long for most ambulances.
- Need for designation of immediate treatment area near disaster site.
- Need for more adequate first aid training for fire and police personnel, including transportation of the injured.
- 7. Need for first aid equipment at disaster site.
- Ambulance coordinator lost control because some drivers did not follow in-

- structions and vehicle radios were on different frequencies.
- Out-of-town vehicles delayed by inadequate state highway and city street signs giving directions to hospital.

## COMMUNITY-WIDE EMERGENCY HEALTH SERVICES

Special Contribution JAMA, Vol. 204, May 13, 1968, pp. 595-602

American Medical Assn., 535 N. Dearborn St., Chicago, Ill. 60610

Believing that many of the 700,000 annual deaths from medical and surgical emergencies in the United States could be prevented by improved emergency medical services, the Committee on Acute Medicine of the American Society of Anesthesiologists reports detailed recommendations. The goals are to improve services at the scene of the emergency, during transportation and at the hospital-

#### Community Recommendations

Total community emergency medical care programs should be evaluated, coordinated, upgraded, and supervised by appropriate community council, representing medical specialists, public safety and rescue personnel, and medical, safety, health, and disaster agencies which can establish guidelines, training programs, and support services.

First aid courses should be obligatory in high schools and for drivers' licensure and be widely encouraged for the lay public. There should be statewide minimal training standards and licensing for ambulance and rescue staffs.

Communities should establish Emergency Medical Operations Centers to serve as communications and vehicle dispatching centers for everyday medical emergencies as well as for disaster.

#### Early Treatment and Transportation Recommendations

Training for ambulance attendants, directed by a physician, should include Basic Training: (1) Red Cross advanced first aid or equivalent; (2) cardiopulmonary-resuscitation course, with certification and yearly recertification by American Heart Association; (3) instruction by a physician in emergency care, including childbirth and management of acute mental conditions; (4) written and practical testing.

Advanced Training: (1) By anethesiologists in operating and recovery rooms; (2) by nurses and inhalation therapists in intensive-care unit; (3) by physicians and nurses in emergency room; (4) observation of obstetric deliveries; (5) instruction in newborn resuscitation; (6) by physicians in performing tracheal intubation, electrocardiography, defibrilation, and I.V. administration. In addition, attend ants should have: (1) defensive drivers' course; (2) practice in patient transportation; (3) continuing on-the-job education in receiving radiotelephone advice from physicians; (4) continuing education through periodic seminars and practice sessions.

Most vehicles presently used are inadequate for life support. Detailed recommendations are given for vehicle design, stretcher design, types and quantity of equipment for suction, oxygen, artificial ventilation, first aid, medical, and infant care. Helicopter transportation with heliports at major emergency hospitals is suggested.

#### Hospital Recommendations

Hospitals should be categorized according to emergency and intensive-care facilities as:

- First Aid Facility.—One where a physician is not present at all times.
- Emergency Hospital.—Staffed by physician at all times, but not team of specialists.
- Major Emergency Hospital.—Team of specialists available within minutes, backed up by high standard hospitalwide services and equipment.

Detailed recommendations are given for Emergency Hospital emergency room staffing and equipment and for Major Emergency Hospital backup services and intensive-care unit policies and facilities.

## AN EMERGENCY MEDICAL SYSTEM-ANALYSIS OF WORKLOAD

Barry G. King, PH. D.; Ellis D. Sox, M.D.,

Public Health Reports, Vol. 82, Nov. 1967, pp. 995–1008

Public Health Service, Lee Bldg., 6935
Wisconsin Ave., Chevy Chase, Md.
20015

The San Francisco Department of Public Health and the U.S. Public Health Service's Injury Control Program undertook a study in 1963-64 on the initial phases of the city's emergency medical care system. The authors, officials of the two agencies, discuss background information and findings of the study's first objective—to determine the nature and distribution of emergencies and the emergency medical services workload.

The overall objective was to investigate the components of the system and their interrelations as a basis for a general description, such as a mathematical model, suitable for analysis and evaluation of other existing or contemplated systems.

The workload did not vary greatly by day of the week. The Saturday and Sunday peak loads involved an average of 160 patients for the four emergency hospitals combined; the minimum workload, occurring Tuesday, averaged 131. The average number of ambulance runs for a single day did not vary by more than 10 and about one-half the runs for a single day were made between 4 p.m. and midnight.

The vehicles, crews, equipment, and central support personnel constituted one subsystem which interacted with and actively participated in the operation of the other subsystem—the emergency hospitals.

In planning or improving community emergency medical services the single system warrants consideration for its economy and effectiveness. It serves both the sick and injured; combines resources to provide flexibility in using equipment and personnel for emergency calls, transfer runs and patient management at the scene, enroute and at the emergency hospital; offers personnel career opportunities.

When developing a mathematical model of such emergency medical service system one needs input data on:

- Emergencies in a number of urban and rural areas to determine similarities and differences.
- Community's emergencies in relation to distances, terrain and location of hospital, and clinical facilities to determine ambulance crew training requirements.
- 3. Communications dispatching system,

- available telephone, police and fire networks, radiotelephone equipment.
- Cases of individual patients to determine how many are being transported, waiting for treatment, being treated, or discharged at a given time.

## COMMUNITY EMERGENCY MEDICAL CARE

Jack R. Karel, м.D.

The Journal of the Medical Society of New Jersey, Vol. 64, Dec. 1967, pp. 642-43

315 W. State St., Trenton, N.J. 08618

The chairman of the State medical society's Committee of Emergency Medical Care discusses the need for continuous on-going training in this field to prepare for the possible threat of nuclear disaster. This, he says, is best done by strengthening and expanding the organizations already set up to deal with every-day local and material disasters.

In any disaster the public looks to the emergency departments of community hospitals. The Medical Society of New Jersey has assumed leadership as a medical organization for an emergency medical care program in every hospital.

There is need for:

- Development of plans and emergency rooms in all hospitals to cope with many casualties.
- More adequate training of ambulance attendants, to include anatomy and physiology; State medical societies must assume responsibility for this training.
- Strong, well coordinated communications system to bind all elements and

- organizations together from a central point of control.
- 4. Radio network which places all police departments and hospitals in the county on the same frequency, with a direct link to the county civil defense office.
- Two-way radios in local ambulances to maintain contact with all the community hospitals.

ESTIMATING COMMUNITY RE-QUIREMENTS FOR THE EMER-GENCY CARE OF HIGHWAY ACCIDENT VICTIMS

Barry Griffith King, PH. D.

American Journal of Public Health, Vol. 58, Aug. 1968, pp. 1422-30 1740 Broadway, New York, N.Y. 10019

Because there is little substantive material available to help community planners provide care for highway accident victims, the science advisor to the Public Health Service's Injury Control Program presents this report to provide some information and numbers for developing initial plans.

Two general categories of information are needed: (1) The nature and distribution of emergencies and the geography and physical environment to be served; and (2) objectives or goals for the emergency care system. A number of special studies and resulting data pertinent to the first category are cited in this report to guide planners in estimating their requirements. Refinement of emergency hospital records is necessary for cost analyses and meaningful estimates. It is suggested that the Cornell Automotive Crash Injury Research scale for seriousness of

injury and the International Classification of Disease and Injuries be considered in clarifying records.

Far more sensitive criteria than those used currently are needed to evaluate the operation of emergency medical systems. Community goals should be established as time limits for accomplishment of specific phases of emergency medical service. Studies on the effects of delay in treatment are cited, as well as a theoretical approach to determine tolerance of delay.

#### A RURAL EDITOR LOOKS AT EMERGENCY MEDICAL SERVICE

John Boughton; Editor, Nashville News Michigan Medicine, Vol. 67, May 1968, pp. 627-35

120 W. Saginaw, East Lansing, Mich.

The decision of many Michigan funeral directors to discontinue their ambulance services creates problems for small communities all over the State.

Although the frontier tradition of helping one's neighbors still exists, rural counties have many emergency medical problems. Studies have shown that 50 percent more people are injured in rural highway accidents than in urban traffic accidents, their chance of survival is only one-fourth that of the urban injured, and farmworkers have an unusually high accident rate. Three factors are involved:

(1) Timelag between onset and treatment; (2) availability of properly trained help; (3) availability of proper and adequate equipment.

Adding to the problems of rural emergency medical services are the drain on medical personnel caused by the population flows to urban areas, the increase of medical emergencies and accidents brought on by the influx of vacationing urbanites to previously tranquil spots, and more complicated farm machinery which cuts farm help and raises the accident potential for those working in isolation caused by the same machinery.

The author says emergency medical services have been given priority in rural Michigan, but as yet planning is in the talking stage. He cites the American Medical Association's Council on Rural Health five-point program for improving emergency medical services in rural areas and Dr. Jack R. Karel's recommendations in the Journal of the Medical Society of New Jersey for a communications network and ambulance personnel training.

Efforts are underway in Michigan to develop community emergency medical care programs in hospital emergency departments, improve ambulance training and develop coordinated communications networks. Farm and rural organizations are conducting safety programs to reduce the number of accidents. The Michigan State Medical Society and Michigan Health Council are helping arouse interest in health careers. Rural communities are making every effort to interest physicians in their areas. Rural sheriff and fire departments and local police are stepping up first aid training programs and their governing bodies are improving emergency procedures. With rural tradition of involvement, the author believes in time rural emergency medical services may surpass those of urban areas.

## COMMUNITY PARTICIPATES IN DRAMATIC DISASTER DRILL

Sister Margaret Mary, c.s.f.n.

Hospitals, J.A.H.A., Vol. 42, Oct. 1, 1968, pp. 58-61 840 N. Lake Shore Dr., Chicago, Ill. 60611

The administrator of 208-bed Mercy Hospital in Altoona, Pa., reports on a community disaster exercise simulating the results of a local factory explosion.

A telephone call notified the hospital of the "disaster" and announced that victims would arrive in about 20 minutes. Mercy's disaster plan was implemented immediately. By the time the first patients arrived areas for treatment of shock, burns, and trauma had been staffed and supplied. Physicians examined patients in a sorting area near the emergency entrance. Friends and relatives, arriving after hearing news bulletins which interrupted regular radio and television programs, were directed to the staff room by police who directed traffic and parking and by internal traffic control officers. Communication set up between treatment areas and the public relations office kept these visitors informed of the patients' conditions. In 2 hours the hospital had treated 26 victims: five trauma, six shock and 10 burn cases were admitted: three with superficial injuries were released and two multiple injuries were dead on arrival.

An atmosphere of true disaster was created by realistically made-up injuries, torn clothing and disheveled appearances, and well-portrayed suffering by volunteer patients who threw themselves into the spirit of the drama. Hospital auxillary members who portrayed anxious relatives and friends added to the realism by ar-

riving in hastily thrown-on (as they were) costumes and some, refusing to statill room, sobbingly interrupted doctors and nurses and hampered treatment routine.

Drills made as realistic as possible are the best way to ensure steady, efficient performance by hospital personnel under pressure of disaster. In spite of the planned distractions the medical personnel at Mercy worked effectively. However, they admitted later that the situation nearly reached a state of chaos when the "relatives" arrived. As a result of the drill disaster victims could be evacuated, treated, and returned to their homes or hospitalized with a minimum of confusion. Without the experience, pandemonium would reign, Sister Margaret Mary feels.

#### COMMUNITY ACTION ON EMER-GENCY MEDICAL SERVICE

Journal of the Medical Association of the State of Alabama, Vol. 37, March 1968, pp. 1103-11

19 S. Jackson St., Montgomery, Ala. 36104

Since an estimated 20,000 victims of automobile and other accidents die needlessly each year because of inadequate emergency medical services and fatalities and injuries increase each year, the AMA's Commission on Emergency Medical Services calls for community-wide action to improve these services.

This report offers guidelines to aid the formation of community action programs. The community plan must be compatible with existing program planning for health facilities and services and be designed to encompass disasters of any magnitude.

The community must develop an organization which is able to coordinate all components of emergency medical services in the geographic area to assure residents that:

- They are provided with the most upto-date methods of first aid and emergency care by laymen, ambulance attendants, policemen, or physicians.
- The vehicles transporting them will be the best staffed and equipped attainable.
- Emergency communications will assure timely response in discovery and treatment.
- Personnel and equipment in emergency facilities will assure highest quality medical care.

The community organization's work should begin with evaluation of present emergency medical services, regardless of the length of time required. It must then use available help to correct deficiencies considering: (1) Best training programs to teach general public basic first aid; (2) standards for ambulance services; (3) best available communications systems; (4) equipment necessary for hospital emergency facilities; (5) required standard of care; (6) manpower resources to staff and direct all components of the emergency medical services system.

#### EMERGENCY HEALTH PLAN-NING — WHOSE RESPONSI-BILITY?

R. W. Tooley, M.R.C.S., L.R.C.P., D.P.H.;
D. Kubryk, C.D., M.D., D.P.H., F.A.P.H.A.;
J. N. R. Scatliffe, M.B., B.S., D.P.H.

Canadian Journal of Public Health, Vol. 58, Oct. 1967, pp. 433-38

Canadian Public Health Assn., 1255 Youge St., Toronto 7, Ontario, Canada

#### The Health Department's Responsibility in Emergency Health Planning

Planning involves everyone from the Federal Government down to the individual family unit and to be effective the planning must be done now. Citing the fact that emergency health planning has become a normal function of government at all levels through law, provincial acts, and municipal bylaws, and has become an accepted public health responsibility in the United States and Canada, one official outlines the status of planning in Canada.

Some 600 public health personnel, physicians, nurses, engineers, veterinarians, and inspectors, representing 95 percent of Canada's local health departments, who attended emergency public health service courses, were asked, "Whose responsibility is emergency health planning?" Their answer: "The community public health agency is the only logical one to assume leadership in the health field in disaster." There was no dissenting voice or minority opinion.

#### The Relationship Between the Health Department and the Hospital in Emergency Health Planning

The joint involvement of health department and community hospital in emergency health services planning is recognized as essential to a community disaster plan, but the same responsibility for day-to-day emergency health service is often overlooked. Basic planning for the usual occurrence can be expanded to cope effectively with a casualty load of epidemic proportions and even war conditions.

The author discusses health department planning as it relates to the community emergency preparedness planning, special considerations for a war situation, mass casualty care, and the development of health centers throughout Britain and their potential in the health picture.

#### STATE

EMERGENCY MEDICAL PROB-LEMS IN RURAL AREAS

Valentin Wohlauer, M.D.

Rocky Mountain Medical Journal, Vol. 64, Aug. 1967, pp. 43-8 1809 East 18th Ave., Denver, Col. 80218

Chief of Health Mobilization Services [now Emergency Health Services] for Colorado Health Department outlines State emergency health programs.

Medical Self-Help, the program designed to train a member of every family in the country to meet his family's health needs in time of emergency when no doctor is available, has been widely accepted, with such groups as PTA's, farm organizations, service clubs, school and health organizations, and societies sponsoring classes.

Fifty Packaged Disaster Hospitals, with bed capacity of 10,000, have been strategically placed throughout the State doubling potential hospital bed capacity. Training courses and exercises for hospital staffs have been held in cooperation with other emergency service agencies. Criteria for small scale local disaster, major and national disaster, and operational actions, including hospital relocations, have been established.

Personnel training in disaster preparedness, especially in rural areas, has been established to provide a nucleus medical staff for widespread disaster. This program includes mass casualty training for physicians, disaster medical courses for veterinarians and dentists, special seminars for nursing personnel, a new program in disaster preparedness for sanitarians and environmental personnel and emergency health service planning programs for key medical and civil defense planners.

Training programs and standards are being developed for ambulance personnel and local communities and counties are seeking ways of improving and augmenting ambulance services, heretofore handled in large part by local mortuary firms.

The author also discusses steps being taken to provide blood to rural areas following large scale disasters, the poison control program and accident prevention which has special significance to the everincreasing resort areas. In closing, he touches on disaster planning programs in Switzerland, Norway, and Denmark that might be considered in this country.

AREAWIDE PLANNING FOR EMERGENCY CARE: A STATUS REPORT FROM NEBRASKA

Kenneth F. Kimball, M.D.

Hospitals-J.A.H.A., Vol. 42, June 1, 1968, pp. 99-102
840 N. Lake Shore Dr., Chicago, Ill. 60611

Half of Nebraska's population lives in one-fifth of the State, 59 of the 93 counties have less than 10,000 and only six have 30,000 or more. Of the 1,684 physicians, 1,005 live in Omaha and Lincoln and 11 counties have none. Fifty-nine of the 129 State licensed hospitals have less than 30 beds and 20 counties have no licensed hospital.

Emergency departments vary greatly. Large hospitals have complete separation of emergency, outpatient, and operating facilities; emergency and outpatient departments overlap in medium-sized hospitals where patient loads are not heavy; in small community hospitals outpatient and emergency are combined. Many emergency departments' patient loads have doubled in the last 4 years and this increase is expected to continue at more rapid rate.

Traffic accident statistics, important in emergency planning, show that: (1) Most fatalities occur on State and county roads in rural sections; (2) the chance of accidents around Omaha and Lincoln are twice that of other areas, but the chance of fatalities are half as great.

Communications have been a problem. Most ambulance radio equipment does not operate outside the community; band radio and sheriffs' networks are overcrowded and messages unrelated to emergencies discourage hospital listening; many small hospitals have no equipment, so relayed messages are delayed and frequently distorted.

Many State, professional, and volunteer organizations and agencies have met voluntarily as a body to improve emergency facilities in the State. Their accomplishments described here by the chairman of State Medical Association's Committee on Emergency Medical Services include:

1. Approval of a State health radio net-

- 2. A survey of emergency departments throughout the State.
- 3. A listing of qualified first aid instructors throughout the State.
- The State and U.S. Department of Transportation plan to evaluate the evacuation of highway casualties by helicopter, with physician and highway patrolman aboard.
- An experiment in electrocardiogram interpretation is being carried out by Good Samaritan Hospital in Kearney and the University of Nebraska School of Medicine in Omaha.
- 6. A committee formed by representatives of the State medical and hospital associations, office of civil defense and health department will send representatives to aid communities in the development and updating of community-wide emergency planning.

## MEDICAL AND PARAMEDICAL

ROLE OF THE HOSPITAL PHAR-MACIST IN DISASTER PRE-PAREDNESS

Earl A. Schwerman

American Journal of Hospital Pharmacy, Vol. 24, Nov. 1967, pp. 636-38 4630 Montgomery Ave., Bethesda, Md. 20014

This paper by the assistant director of pharmacy and central supply service, Rochester Methodist Hospital in Rochester, Minn., outlines the multifaceted role of the pharmacist. In addition to his primary responsibility of providing pharmaceutical supplies in disaster, the pharmacist should:

- Be familiar with concepts of handling mass casualties.
- Study and evaluate his own hospital's disaster plan.
- Prepare the pharmacy section of the plan to procure, store, control, and distribute pharmaceuticals to all disaster areas within the hospital.
- Select pharmaceuticals in consultation with medical staff.
- Inventory all supply resources and maintain locator file system.
- 6. Maintain personnel assignment file system.
- Plan for initiation of manufacturing program.
- 8. Test disaster plans.
- 9. Instruct others in Medical Self-Help. Because of his special training and background the pharmacist could assume responsibilities outside his usual hospital role, for instance as a shelter manager, "house doctor" if a physician is not available, member of a radiological monitoring team, special assignment in a Packaged Disaster Hospital, and he might become involved in developing plans to maintain adequate levels of pharamceuticals and other supplies in the Federal medical stockpile.depot system.

#### CHANGES IN DISASTER MEDI-CINE

George W. Pashal; Francis C. Jackson

Pennsylvania Medicine, Vol. 71, Jan. 1968, pp. 90-2

4111 Beech Ave., Erie, Pa. 16508

This paper on the role of the physician in combating the effects of natural and

man-disaster outlines the changes in disaster medicine and clarifies current programs of the Committee on Disaster Medical Care of the Council of National Security of the American Medical Association.

In 1966 the scope and mission of the committee was broadened to include all disasters and programs were launched to develop "a disaster conscience" for the physician and establish a science of disaster medicine. The most recent redirection of significance has been the incorporation of disaster medical services within the sphere of general emergency medical services available in the community.

The authors outline current programs of the Public Health Service and Department of Transportation and such national agencies as the National Academy of Sciences and National Research Council. Future goals are summarized, including: A Proposed Research Center for Emergency and Disaster Medical Services.

POSTGRADUATE EDUCATION OF COMMUNITY PHYSICIANS, Emergency Care Training in the Emergency Ward

Stephen E. Goldfiner, M.D. and Daniel D. Federman, M.D.

JAMA, Vol. 206, Dec. 23-30, 1968, pp. 2883-84

American Medical Assn., 535 N. Dearborn St., Chicago, Ill. 60610

In a departure from the traditional lecture-oriented postgraduate medical education for community physicians, a special 2-week course in modern emergency-ward techniques was set up in a hospital to fit specific requirements of three general practitioners, all out of medical school for at least 20 years. They had retired from private practice to form the core of a group to provide full-time emergency ward coverage in a community hospital and explicitly stated they would be happy to work alongside young interns and residents in the teaching hospital.

#### Training

- House officers and senior staff were instructors.
- Physician-students received temporary appointment of Graduate Assistant in Medicine for forensic purposes and participated in patient care supervised by house staff.
- They went through rotation in endotrachael intubation in the OR area, rounds in coronary care unit, or overnight ward rounds, then reported to the emergency ward for the day.
- 4. Two-hour afternoon precept instruction sessions were held in arrhymias; cardiac monitoring and defibrillation; respiratory physiology; and acute management of fevers, head and chest injuries, alcoholism and drug ingestion, and gastrointestinal bleeding.

#### Results

- Residents and interns took special interest and gained valuable education working with community physicians.
- 2. Physician-students very satisfied but decided training time too short.
- Physician-students arranged for continuing education at their own hospital and arranged for university hospital staff member to participate in a

monthly audit of their emergency ward care.

The University of Maryland has established a "Visiting Fellowship In-Service Program" for interested physicians and St. Luke's Hospital in New York plans to establish 2-, 4-, or 6-week "Clinical Fellowships" that will allow community physicians to return to the hospital full time to participate in teaching, patient care and research activities.

# THE DENTAL PRACTITIONER'S ROLE IN EMERGENCY HEALTH SERVICES

C. Aberdeen E. McCabe, D.D.S., D.D.P.H., F.I.C.D., F.A.C.D., F.R.S.H.

Canadian Medical Association Journal, Vol. 96, Jan. 28, 1967, pp. 192-95 150 St. George St., Toronto, 5, Ontario, Canada

In a national disaster many of Canada's 22,000 physicians and 85,000 nurses, located for the most part in target areas, would be among the casualties and surviving medical personnel would need a great deal of assistance. A dental advisor to the Emergency Health Services Division, Department of National Health and Welfare, points out that survivors among the 6,396 dentists should be ready to assume some of the medical burden.

The dentist's training—most closely parallel to the physician's—manual dexterity, and experience in management of hemorrhage, shock, debridement, suturing, reduction and immobilization of fractures, and control of pain and infection would be most valuable. He could perform first aid, including but not limited to artificial respiration, early management of chest wounds, preparation of casualties for movement, triage of facial and oral injuries and assistance in general surgery procedures.

The specific role of individual dentists will depend upon the community organization of Emergency Health Services. The Canadian Dental Association's policy statement on Civil Defence expressed the view that dentists can best serve as members of casualty care teams along with physicians, nurses, and other health personnel and can fill staff requirements of Advanced Treatment Centres and 200-bed Emergency Hospitals.

## TO HELP OR NOT TO HELP—A NURSE'S DILEMMA

Gordon F. Henderson, q.c.; George E. Fisk

The Canadian Nurse, Vol. 64, Feb. 1968, pp. 33-6

50 The Driveway, Ottawa 4, Ontario, Canada

Ottawa lawyers examine Canadian law and United States "Good Samaritan" laws pertaining to the rendering of aid in emergencies to determine whether new laws are needed.

Citing a number of cases, the authors show that the problem of liability of medical personnel for rendering aid at the scene of an accident is not as serious as members of the medical profession appear to believe. An American Medical Association survey and individual research has not found a single case in which a doctor or nurse has been held liable.

There is no legal liability for error in judgment. If a medical practitioner exercises the skill of the average standard of the group to which he belongs, he has carried out his duty to the patient with reasonable care and no liability will ensue. A nurse would be judged as to whether she acted reasonably in view of her training and experience. If she acted in a reasonable manner in the diagnosis and treatment of an accident victim, she would not be liable in law. If she does not do what a reasonably competent nurse of her training and experience would have done, she can be sued for negligence. The term "malpractice," frightening to professionals, really means "negligence."

Common law is solicitous of rescuers and extreme medical incompetence must be shown before they can be held legally accountable. The "Good Samaritan" laws are open to objection on the grounds of vagueness in terms of protection and persons covered. New legislation along similar lines would not seem to give greater protection but might create confidence, making medical people more willing to give aid in emergencies. If such laws were enacted, a positive duty might be imposed on the doctor or nurse to stay and assist.

The authors also discuss the rights of medical personnel to sue for fees for emergency treatment and compensation for injuries received while assisting accident victims.

It is concluded that the problem is one of education of medical personnel rather than one of legislation.

#### **TECHNICAL**

## SURVEILLANCE OF NUCLEAR POWER REACTORS

Charles L. Weaver, M.s.; Ernest D. Hayward, M.s.

Public Health Reports, Vol. 82, Oct. 1967,

Public Health Service, Lee Bldg., 6935 Wisconsin Ave., Chevy Chase, Md. 20015

The Public Health Service's National Center for Radiological Health presents this paper as a general guide for public health workers interested in the technical aspects of nuclear reactors and the scope of environmental surveys as they relate to surveillance.

Nuclear power has expanded rapidly. In 1965, reactors with a capacity of 4,870 megawatts electric (MWE) were ordered by utility companies. The Atomic Energy Commission, responsible for regulating nuclear reactors, predicts a level of 120, 000 to 170,000 MWE by 1980.

Before the Atomic Energy Commission announces the public hearing for a proposed nuclear power plan the local health agency must decide whether it will participate as an intervenor—taking part in cross examinations—or make a limited appearance by presenting prepared testimony.

According to interagency agreement, PH's Center for Radiological Health reviews all safety analysis reports for AEC to evaluate site suitability, plans for environmental surveillance, waste management practices, emergency plans, and calculation of emergency exposures.

Although reactors are relatively safe, public agencies and nuclear power operators should be concerned with emergency planning because:

- Although accident probability is extremely low, consequences might be severe.
- 2. More and more power reactors are being built.
- Their power levels have greatly increased, increasing accumulation of fission products and potential hazards.
- 4. Reactor sites are being selected closer to urban areas.
- Large numbers of people might be affected by nuclear accident.

Hazards are associated principally with major accidents rather than with normal operation. The most severe accident is that which releases fission products into the atmosphere. As part of their overall radiological health responsibilities, health agencies should incorporate planning for reactor emergencies in their activities.

The reactor operator's emergency plan should provide for:

- Sufficient onsite and offsite instrumentation to detect an emergency condition quickly.
- Procedures to evaluate and determine the extent of contamination exposure so that contamination can be rapidly limited.
- Decontamination procedures, movement of people and medical care.
- Notification system to appropriate AEC officials and public health authorities.

The authors also discuss in detail the operations characteristics of reactors (with diagrams); environmental surveillance; and release of fission products into atmosphere, water, milk, crops, and soil.

#### NATIONAL

\*DISASTER PLANNING

Henry C. Huntley, M.D.

International Surgery, Vol. 47, Mar. 1967, pp. 299-302

International College of Surgeons, 1516 Lake Shore Dr., Chicago, Ill. 60610

This editorial by the Director of the Division of Health Mobilization [now Division of Emergency Health Services] of the Public Health Service, outlines the Division's programs to help the Nation's hospitals with disaster planning.

In both the hospital and the community the plan for meeting an emergency is not a separate service, but a means for extending normal services to meet extreme needs. There are three essentials: (1) Communication and transportation facilities, including ability to monitor known risks; (2) standby equipment and supplies; and (3) trained personnel.

In the first crucial hours of a disaster there is no time to wait for outside assistance to arrive. U.S. hospitals seldom maintain large inventories of expendable items, but during a disaster, with the almost inevitable breakdown of communications and transportation, resupply could become difficult, if not impossible.

To assure the availability of enough medical supplies to care for disaster victims, the Division provides hospitals free of charge with backup supplies: (1) Hospital Reserve Disaster Inventories—a 30-day supply of critical medical items and (2) Packaged Disaster Hospitals—complete 200-cot hospitals packed for storage until needed to expand the capacity of the community hospital or to serve as an auxillary facility in another building.

#### \*EMERGENCY HEALTH SERVICES

A. James Thomas, M.S.P.H., M.S.A.

Public Health Reports, Vol. 83, June 1968, pp. 513-17

Public Health Service, Lee Bldg., 6935 Wisconsin Ave., Chevy Chase, Md. 20015

The number and severity of emergencies increase with the growth of population and technology; more man-made disasters occur and more people are affected.

The great difference between natural and thermonuclear disasters—nuclear accidents or warfare—is the extent of the effects. In thermonuclear attack most of the 225 U.S. Standard Metropolitan Statistical Areas might be hit simultaneously and large percentages of all health resources lost; approximately 100 million people would need care.

The chief of planning and evaluation for the Division of Health Mobilization [now Division of Emergency Health Services] outlines the governmental structure of organizations to cope with the health aspects of disaster. Federal and State governments have comprehensive plans of organization and action for emergency health care, but many local governments have not prepared or practiced their plans. An effective local plan is the only way to cope with any health emergency. Its success depends upon close cooperation among State, regional, and national agencies; sound organizational development and practice testing.

All local plans must include:

 Strengthening existing health and medical plans that can help alleviate emergency health situations.

- 2. Creation of a standby emergency health organization.
- 3. Selection of key staff and alternates.
- 4. Training all personnel in emergency
- Development of communications system for interagency and interjurisdictional cooperation.
- Development and positioning of records for emergency operations.
- 7. Obtaining resources for emergency use.
- 8. Locating additional resources.

- Conducting test exercises to improve standards.
- Encouraging development of hospital disaster plans.

In a national emergency the community health organization would be responsible for managing all available resources and obtaining additional resources and support services from State and Federal organizations.

Governmental structure provides a complete communications system—from local to Federal levels—to direct programs and operational policy.



#### EMERGENCIES AND DISASTERS

#### HIGHWAY ACCIDENTS

HIGHWAY SAFETY—A PROGRESS REPORT

William Haddon, Jr., M.D.

Journal of the Medical Association of Georgia, Vol. 56, Nov. 1967, pp. 456-59 938 Peachtree St. NE., Atlanta, Ga. 30309

Highway casualties in the United States total over 10,000 injuries daily, more than 1,000 deaths weekly, require 8 million days of hospitalization each year to treat survivors, and cost an economic loss of about \$1 billion each month.

Citing these figures, the director of the National Highway Safety Bureau discusses the precrash, crash, and postcrash phases of this national problem.

The precrash phase is concerned with mechanical failures of vehicles, medical and other human conditions that may lead to incapacitation while driving, and highway design and maintenance; crash phase is concerned with safety design of vehicles and highways; and postcrash is concerned with emergency communications, transportation, first aid, and medical care.

Our emergency services are unnecessarily archaic. We can rescue the seriously wounded in the jungle, but we cannot cope with highway injuries although highways do not move, hospitals are stationary, and weekend and evening traffic

conditions which take a high toll are predictable.

Brief outlines of the National Traffic and Motor Vehicle Safety Act and the Highway Safety Act of 1966, passed to correct some of these problems, are given.

THE EFFECT ON SURVIVAL OF DELAY IN EMERGENCY CARE IN MOTOR VEHICLE INJURIES IN LOUISIANA

M. Clinton Miller, рн. р.; W. Randolph Page, м.р.

The Journal of the Louisiana State Medical Society, Vol. 120, Jan. 1968, pp. 1-6 1430 Tulane Ave., New Orleans, La. 70112

This study, supported by the Louisiana Highway Safety Commission, explores the effects of delay in obtaining medical care on the probability of survival for individuals injured in motor vehicle collisions.

Fatalities and survivors in rural, suburban, and metropolitan communities were studied to find out whether there are significant differences in elapsed times between the groups. Elapsed times were: (1) From collision to notification of authorities; (2) from collision to arrival of investigating officer and presumably ambulance; (3) from notification to arrival of investigating officer; (4) from collision to hospital; and (5) from notification to hospital. Charts on 275 cases are included.

#### Results

- Sixty percent of rural cases were transported by private car or State police vehicles, but in urban and suburban areas the number was too small to warrant comparison.
- The average survivor age was 30 while
   38.7 was average in the fatal group.
- The elapsed times for the rural, suburban, and urban areas were significantly different, in general showing progressive increase in delay from the suburban through the metropolitan to the rural communities.
- There was very little difference between total times elapsed for those who survived and those who died.
- The notification delay was greatest in rural fatalities. This may reflect a lack of emergency communications system.
- The report reflects difficulty in reaching authorities in rural areas and in getting patients to treatment facilities because of transportation, traffic conditions, and distances traveled.
- Law enforcement records concerning collisions were more complete than records of emergency treatment facilities.

#### Conclusions

There is need for: (1) A test of improved communications on selected urban and rural areas of high collision risk; (2) a test of the effectiveness of a generally available ambulance service; (3) a training program for ambulance personnel; and (4) a program for improved reporting of auto collision injuries by emergency treatment facilities.

THE IMMEDIATE CARE OF ROAD TRAFFIC AND TRACTOR CAS-UALTIES IN A RURAL AREA

W. Dewi Rees, M.B., B.S.

Journal of Royal College of General Practitioner, Vol. 15, Feb. 1968, pp. 115-22 Prospect House, Dartmouth, Devon, England

This study covers the local management, transportation, and disposition of accident victims in a relatively isolated area of Wales during a 4½-year period. Data was obtained from records of hospital patients, general practitioners, the coroner, police reports, and local ambulance logbook.

Results: There were 124 traffic and tractor accidents in the 110-square-mile area and 201 injuries: 80 serious, 110 minor, and 11 fatal-eight were found dead at the scene and three died in hospital. None died in transit. All fatalities were seen at the accident site by general practitioners. Two mid-brain injuries died in the local hospital and one with multiple injuries died there in an artificial kidney unit where he was transferred after becoming uraemic. These results compare very favorably with road accident figures for the City of Birmingham where approximately 20 percent died in transit and the mortality rate for those admitted to Accident Hospital was 8 percent.

Disposal: Thirty-seven casualties were admitted to the local hospital; 27 others were transfered 30 miles to the nearest major general hospital; others were sent two or three times that distance to specialty hospitals, sometimes determined by the victim's residence.

Transportation: The county ambulance service is unique in Great Britain in that it is manned entirely by volunteers who are engaged in other fulltime employment. All drivers are members of the St. John Ambulance Brigade and receive first aid training from local doctors. They transported over half the casualties; others were conveyed in various types of vehicles described.

#### STUDENT AND FACULTY SUR-VIVAL ON THE HIGHWAY

William D. Alsever, M.D.

Journal of American College Health Association, Vol. 16, Feb. 1968, pp. 214– 22

Box 9117, University of Miami Branch, Coral Gables, Fla. 33834

A physician at Syracuse University discusses vehicle traffic statistics and investigations which have been made in an effort to reduce trauma in accidents, emphasizing the necessity for wearing a seat belt at all times. He explains what a belt will and will not do and discusses such factors as shoulder harness, size of car, alcohol and drugs on highway safety.

Reasons for Wearing Seat Belt: (1) Prevents ejection; (2) keeps the wearer from being violently displaced by impact; (3) decreases to a limited extent impact injuries resulting from head hitting windshield; and (4) prevents lacerations and fractures of lower extremities caused by hitting instrument panel.

Surveys show that only 30 percent of those who have belts in their cars use them. Apparently the others do not because of ignorance and laziness. Such objections as possible injury from the belt itself or belt failure have proved to be rarely valid. Length of trip, speed, weather, and road conditions should have no bearing on the wearing of belts since fatalities occur on short trips at low speed under excellent conditions.

The shoulder harness must always be used with the safety belt—never alone! When properly installed (figures illustrate proper and improper installation), the harness can markedly lower mortality and morbidity in drivers and front seat passengers, by 11–13 percent in addition to reduction achieved by the use of safety belts alone. While accidents do not happen more often in small cars, when they do occur, fatal and serious injuries are about 20 percent higher than those in standard cars. The types of injuries show the use of belt and harness are essential to safety in a small car.

The author recommends that: (1) All colleges require students and faculty to have safety belts in their cars; (2) physicians be more vocal in demanding safer vehicles, improved roads, unified traffic codes and highway signs, improved screening of drivers, and better traffic law enforcement; and (3) that highway safety education be on a par with sex education, drug education, and the like.

#### NATURAL DISASTERS

SCHOOL ENDS IN FLOOD

Elva Scott, R.N.

The Alaska Nurse, Vol. 17, Fall 1967, p. 1 1650 East 27 St., Anchorage, Alaska 99504

A registered nurse attending graduate classes at the University of Alaska recounts her experiences and those of her teen-age sons as volunteers during the August 1967 flood in Fairbanks.

After the 5-day onslaught of torrential rains and minimal preparations for flooding, Mrs. Scott and her sons—the younger a 13-year-old diabetic—were forced with thousands of others to take refuge at the university on the hill. Over 8,000 were housed there when they arrived and the cafeteria served meals continually, one meal running into another. Mrs. Scott offered her services at the dispensary where she was put on night duty; the older son worked on rescue in town and the younger boy, with the help of his emergency candy, filled sandbags to keep the power plant from being flooded.

The hospital was set up in a dormitory. The first floor was turned over to patients, the counselor's apartment became the office and her bedroom was readied for possible deliveries; baby food and diapers were handed out in the lobby. Physicians brought all the medicines and supplies they could carry which lasted through the crisis. Most patients were cardiacs under distress, recent fractures, and older diabetics, and several were treated for rat bites from rodents forced from their homes by flood waters. Pet dogs were tied to almost all trees on campus and a veterinarian provided tranquilizers for troublesome ones. The diary account covers problems and patients encountered during the Scotts' 2-day stay.

## AFTERMATH OF A DEADLY TWISTER

Medical World News, Vol. 9, June 7, 1968, pp. 34-6 299 Park Ave., New York, N.Y. 10017

On May 15, 1968, the tornado rampage which battered 11 States plowed a

quarter-mile-wide and 13-mile-long furrow across Jonesboro, Ark., leaving more than 400 injured and 35 dead. Dr. Grover Poole and Col. H. C. Knowlton, administrator of St. Bernard's Hospital, report on their disaster operation. On a normal night, the 204-bed hospital's emergency room receives four or five casualties from the 150,000 people it serves. This night 39 physicians treated more than 400.

Because the hospital had no neurosurgeon, patients with serious head injuries were transferred to Memphis hospitals 75 miles away. Ambulances, station wagons, and campers were used to transport the victims under police escort. After 2½ hours, with nine operating rooms working at full capacity, at least 40 patients, with lacerations requiring 30-45 minutes per person for suturing, were still waiting to get in. When beds and patient-care supplies were exhausted, the Packaged Disaster Hospital stored at an armory was opened and a first aid station set up to treat the less serious injuries.

"We know we tried to do too much," says Knowlton.

"Next time," adds Dr. Poole, "we won't do any surgery; we will stop the bleeding and treat for shock, then transport as many victims as possible to nearby hospitals for surgical repair."

Disaster plan revisions reflecting this experience include:

- Primary attention will be devoted to hemorrhage control and shock therapy, with surgical candidates transferred to nearby hospitals.
- A portable blood donor station and mobile first aid unit will be equipped.
- An emergency morgue will be located in another building.

\*PHYSICIANS EVALUATE MEDI-CAL ASPECTS, EFFECTIVENESS OF PLANS IN BEULAH

Charles R. Queen, M.D.; Roy S. Stewart, M.D.

Texas Medicine, Vol. 63, Nov. 1967, pp. 124-30

1801 N. Lamer Blvd., Austin, Tex. 78701

The district director of disaster medical care for five southwest Texas counties and his alternate describe disaster operations and offer suggestions for area planning.

The storm, followed by 95 recorded tornadoes, dropped twice the annual rainfall on the Rio Grande Valley in 36 hours, flooding towns and driving thousands of refugees across the Mexican border.

The State Plan for Survival is designed with built-in flexibility to cope with natural disasters through district and interdistrict agencies. Four Packaged Disaster Hospitals (PDH's) were stored in the valley district; medical societies held PDH and disaster medical care training programs; hospitals had disaster plans and held mutual support meetings, but all preparedness plans were not complete when Beulah struck.

At the warning, disaster directors met and established ham radio network between the hospitals which worked well until loss of power and antennas, fatigue and other demands overtook volunteer operators. A crystal-tuned radio network which can be manned by other than fully licensed operators is more suitable in disaster. When intercommunications failed, 2-hour checks were made at hospitals for information on power, damage, casualty flow, and operating room availability.

Brownsville Hospital disaster director moved his PDH to Edinburg Hospital 70 miles away just before the storage building was destroyed. Hospitals discharged all but the very ill, alerted employees, assigned medical staffs, and arranged to care for large numbers of casualties. All highways to the valley were impassable, towns were flooded, communications were out with exception of Department of Public Safety and sheriff's radio, which relayed a message that 12,000 Mexican refugees had entered Rio Grande City and Roma.

Within 8 hours, supplies from four PDH's and Hospital Reserve Disaster Inventories (HRDI's)-critical items stocked in hospitals by U.S. Public Health Service-were transported by air and trucks that could ford the area; medical teams came from San Antonio, Galveston, and Baytown. An emergency hospital was set up at the Fort Ringgold school complex in Rio Grande City where approximately 2,000 outpatients were treated; 75 were hospitalized; about 40 children received intravenous infusions, including many severely dehydrated infants; surgical and other serious cases were transported to other hospitals. A heliport was established on Fort Ringgold parade grounds and Edinburg Hospital was control hospital for evacuation; U.S. Army and National Guard troops were "everywhere doing everything, solving the unsolvable."

The State Tuberculosis Hospital had to evacuate its 123 patients by helicopter to Weslaco and Edinburg hospitals which expanded their capacities with PDH supplies by 112 and 63 beds, respectively.

Mosquitoes reached an intolerable level because of standing water and the U.S. Air Force sprayed with malathion which destroyed the insects within 2 hours. Mass typhoid immunization was initiated be-

fore the refugees returned to Mexico with followup to be accomplished by Mexican health officials.

As a result of Beulah, the authors offer suggestions for future planning:

- A district control center with adequate communications staffed by heads of all disaster organizations capable of making on-the-spot, binding decisions is essential.
- Local caches of PDH's and HRDI's are mandatory.
- Local interhospital cooperation is important. A hospital can be expanded by two or three times its normal capacity with PDH or other emergency supplies.

THE RAINS CAME, THE WATER ROSE, AND FAIRBANKS HOS-PITAL WAS INUNDATED

Modern Hospital, Vol. 109, Oct. 1967, p. 122

McGraw-Hill Publications, 1051 Merchandise Mart, Chicago, Ill. 60654

Three weeks after developing a new evacuation plan, St. Joseph's Hospital, Fairbanks, Alaska, had a chance to test it in a major flood. Forewarned by continuous rain and the rising Chena River, 150 feet from the hospital, two staff physicians began the operation at 9:30 p.m.

Citywide telephone service was out so they used a ham radio and civil defense truck radio to call for miltary and civilian transportation. Each patient had a blanket and strip of adhesive with his name on his forehead and carried a paper bag containing his medicine cards and medication. Duplicate patient lists were prepared for checkout as they left. Evacuation took 80 minutes. Thirty minutes later the bridge to the hospital was closed. By

dawn, helicopters had to land on the roof to evacuate remaining staff and supplies.

Three weeks later, still out of touch with staff by telephone, the hospital reopened for emergency admissions by setting up portions of a Packaged Disaster Hospital on the second floor.

TWO HOSPITALS TREAT MAJOR-ITY OF CASUALTIES AS MID-WEST TORNADOES KILL 70, INJURE 1300

Hospitals—J.A.H.A., Vol. 42, June 16, 1968, pp. 128-9 840 No. Lake Shore Dr., Chicago, Ill. 60611

During the record onslaught of Midwest tornadoes in May 1967 (67 in 24 hours), Arkansas and Iowa bore the brunt of the disaster. Two hospitals treated 90 percent of the casualties: Floyd County Memorial Hospital in Charles City, Iowa, and St. Bernard's Hospital in Jonesboro, Ark.

In Charles City all public utilities were knocked out for 48 hours, but Floyd Memorial operated on emergency generators; water was brought in by milk tank trucks and police radios were used to keep constant check on available beds in other hospitals. The hospital disaster plan called for triage teams to go into the disaster area which was impossible because it was too widespread and inaccessible. The 89bed Floyd Memorial became the triage center for about 500 victims. Many casualties were moved from there to other hospitals and the low death rate is credited to the quick movement of patients to treatment areas. The disaster plan is being revamped, in cooperation with seven other area hospitals, to designate one hospital as a triage center. Floyd Memorial also plans to dig its own well.

Only nine of the 204 beds at St. Bernard's Hospital were available, but 39 victims were admitted, 67 were evacuated to Memphis, Tenn., hospitals and 425 received emergency treatment. A Packaged Disaster Hospital stored at the University of Arkansas armory was opened and a first aid station was set up there for minor injuries. Students volunteered at itter bearers, using PHD cots when the hospital's supply of litters ran out.

The 61-bed Mercy Hospital in Oelwien, Iowa, cared for over 200 casualties by using the cafeteria for an emergency room, staffed by volunteer physicians, nurses, Red Cross personnel, college students, and ham radio operators who provided a communications outlet when the telephones failed. The emergency generators went on as soon as the power lines failed and the hospital borrowed two more to keep the elevators running.

#### CIVIL STRIFE

#### \*THE ANATOMY OF A CIVIL DIS-TURBANCE

Its Impact on Disaster Planning Special Report

JAMA, Vol. 202, Oct. 30, 1967, pp. 394-97
American Medical Assn., 535 No. Dearborn St., Chicago, Ill. 60610

This special report, compiled by physicians at Detroit General Hospital, tabulates the numbers, types, and disposition of traumas; time distribution of arrivals; numbers and types of surgical cases during the July 1967 riots in that city, and summarizes new dimensions and modifications needed in urban hospital disaster planning.

Special problems:

- 1. Dimension and duration of disaster is unpredictable.
- 2. Casualties arrive over several days in staccato bursts.
- 3. Staff may be unable to arrive or leave, especially in evening hours.
- 4. Patients with minor injuries may be unable to leave.
- 5. Prisoners and victims admitted need separate security.
- Staff needs protection from outside attack and transportation to and from hospital.
- The administrator has constant liaison duty with news media, police, and military authorities.
- Disaster plans should include specific provisions for the following:
- Security.—Internal and external guards for locked entrances, emergency and ambulance entrances. Guards for prisoners, other patients and staff. Safe transportation for staff and patients.
- Staff.—Increased food and lodging provisions. Adequate rest periods, staff members overestimate endurance.
- 3. Space.—Triage (sorting) area and emergency room should be large enough for rapid traffic flow and well lit in evening. Serious case best treated in individual room with only space for resuscitation team. Adequate beds for normal medical emergencies—such conditions as diabetic, acidosis, and epilepsy may increase from personal neglect and unavailable drugs. Area for discharged prisoners to await transfer.
- Public.—Information service should be set up for distraught, sometimes angry, relatives and friends.

#### HEALERS IN A SICK SOCIETY

Maria C. Phaneuf, м. sc.; Paul Lowinger, м.р.

American Journal of Nursing, Vol. 68, June 1968, pp. 1283-84 10 Columbus Circle, New York, N.Y. 10019

Following the city's riots, two members of the Detroit Medical Committee for Human Rights examine the fear and anger-laden attitudes of hospital staffs and propose corrective measures.

During civil disorders special problems arose:

- In one instance, police and soldiers fired on people from hospital grounds.
- 2. Tension in hospital between professionals and patient rioters.
- Tensions between professionals and ancillary personnel.
- 4. Haste in treating prisoner patients.
- 5. Angry and defensive attitudes shown in post-riot critique.

Day-to-day operations manifest discriminatory care in other ways which indicate that health institutions should:

- Develop intensive inservice education to bring about health care compatible with the dignity of man, to be conducted by representatives from the community and such specialties as psychiatry, sociology, anthropology, and education.
- Examine its philosophy, policies, and practices to discover and correct discrimination.
- Develop a "Geneva Convention" for all hospitals to maintain strict neutrality in civil disorder and provide sanctuary for sick and injured.

## LONG HOT WEEKEND IN NEWARK

Martha Belote

American Journal of Nursing, Vol. 67, Sept. 1967, pp. 1868-70 10 Columbus Circle, New York, N.Y. 10019

This account of the 1967 civil disturbance in Newark is based upon interviews with hospital and public health service nurses. During the 5-day emergency, approximately 700 of the 1,200 injured were treated at Newark City Hospital; 60 surgery patients were admitted.

The hospital was fired on by snipers. National Guardsmen were stationed on the roof and in the nurses' residence and school. Streets and highways into the city were blocked, but 50 volunteers came to help and employees who reached the hospital stayed through the emergency, working double shifts and sleeping about 3 hours at a time in the residence, school, and on cots and litters in the hospital. Personnel were assigned as needed in emergency, surgery, and intensive care units. Food and supplies were no problem, but clerical and switchboard personnel were inadequate.

Children and older patients, disturbed that visitors were prohibited, contacted families by public telephones in the halls.

Community Nursing Service personnel decided their uniforms would provide sufficient security when they left their cars outside the area and walked in in pairs. For them work was "by and large business as usual." City Health Department nurses concentrated their work at health stations operated for children, chest and dental patients; fewer than normal home visits were made.

#### CLINICAL REACTIONS

SIZING UP MISHAPS FROM BOMB FALLOUT

Medical World News, Vol. 9, July 26, 1968, pp. 18-19 299 Park Ave., New York, N.Y. 10017

Atomic bomb test fallout appears to be more than a child's thyroid can stand. A medical team from Brookhaven National Laboratory in Upton, N.Y., testing children on the Marshall Islands, site of the 1954 Bikini tests, found that most of the youngsters on Rongelap have not been developing normally. The glands of 17 out of 19 who were under 10-years old at the time of the blasts soaked up enough radioactive iodine-131 to produce thyroid nodules and stunted growth.

Nodules removed from nine patients, found to be benign, histologically resemble iodine-deficiency goiters. Studies show that some victims are retarded as much as 5 years in weight, height, and bone age. The affected children are treated with weekly doses of synthetic thyroid hormone in the hope of preventing new nodules and in an attempt to improve the stunted development.

In southwestern United States the Public Health Service is studying 5,000 children exposed to possible fallout from bomb tests. Of 2,100 in southwestern Utah, 35 have thyroid problems. Analysis of the studies is statistically complex and investigators are watching for subtle effects that may not be obvious until the studies can be fully interpreted.

## PSYCHOLOGICAL ASPECTS OF MASS DISASTER

Irving J. Farber, M.D., F.A.P.A.

Journal of the National Medical Association, Vol. 59, Sept. 1967, pp. 340-45 1219 Girard St. NW., Washington, D.C. 20009

Throughout history nature and man have caused disasters which have killed hundreds of thousands of people, physically and emotionally crippled millions more, and caused panic among large segments of the population. In 1938 just the thought of disaster panicked 1 million radio listeners among the 6 million who heard the Orson Welles broadcast of a Martian invasion.

The director of psychiatric services at Brooklyn Home for Children in New York discusses in detail how reactions and degree of stress may vary in various types of disasters.

Although the postimpact period has received the most study, one study shows that there are three main reaction groups in the brief impact period: about 15 percent are "cool and collected," over 50 percent are stunned and bewildered, and 10–25 percent are confused with paralyzing anxiety, screaming, etc. It might be of extreme significance to know more of the reactions taking place minutes following disaster for there may be a different quality of illness that develops after this time, described in literature as traumatic neuroses, war neuroses, etc.

Disasters like ship collisions require "on the spot" therapy which includes:

1. Prompt, effective leadership to combat mass hysteria.

- 2. Publishing survivor lists is important in combating panic and maintaining morale.
- 3. Assignment of tasks.

In treating traumatic neuroses of war the prognosis varies with the time factor and the major task is to prevent the syndrom from becoming entrenched in the personality. Treatment in the acute phase includes:

- 1. Permitting the soldier to admit his
- 2. Keeping him in his combat unit.
- 3. If not too disturbed, returning him to active duty within a week's time.
- 4. Hypnosis is effective time saver. Therapy of the chronic phase geared to

help the person realize he has not been annihilated is helpful. The task is an arduous one as chronic traumatic neurosis is much like schizophrenia in its withdrawal with a very high level of anxiety and persecutory delusions. In treating the concentration camp syndrom the results are generally poor. Memory distortions, depersonalizations, delusions, and great anxiety are frequent. Sometimes there is a meaningful allevation of pain if guilt and overt rage can be modified through correction of past distortions.

The author points out that disaster casualties suffering from traumas of the psyche cannot be sorted as mass physical casualties are handled.

### EMERGENCY MEDICAL CARE SERVICES

#### FIRST AID

ACCIDENTS, EMERGENCIES, AND AMBULANCES: A SURVEY IN PORTSMOUTH

W. N. F. Boughey, M.B., F.R.C.S., F.R.C.S., ED.

British Medical Journal, Vol. 1, Feb. 10, 1968, pp. 369-72

British Medical Association, Tavistock Sq., London WC1, England

Report of a pilot study on the treatment and handling of patients at the site of traffic accidents and during transport to Royal Portsmouth Hospital, emergency facility for the city and southeast Hampshire with about 450,000 population. During a period of 20 weeks in 1967, 1,612 cases were studied.

#### Results

Handling patients: 36.4-percent of unconscious cases carried in unsatisfactory position; five in a manner that would embarrass the airway. Forty-two-percent semiconscious cases carried in unsatisfactory position.

Assessment and special injuries: General standard of assessment by ambulance crew was good—60 percent reasonable; 25 percent fair; 15 percent poor. One out of five severe facimaxillary injuries were not treated well. Satisfactory treatment of minor chest injuries, but unconscious se-

vere chest injuries sometimes were posttioned in unsatisfactory manner.

Splinting: Should have been used in 165 cases, not applied in 20 of these. Special study (detailed here) showed inflatable splints to be far superior to other methods.

Haemorrhage, vomiting, airway difficulties: Haemorrhage treated very well except in 11 cases out of 365, these involving extensive scalp lacerations or compound leg fractures. Vomiting not a frequent occurrence; happens in potentially dangerous situations in only 25 percent of total ambulance workload. Some patients in semiprone position continued to have airway difficulties.

Mortality: No deaths occurred in ambulances during time of study. The 47 DOA cases died before ambulance reached the scene. Seven patients died in hospital: Three received adequate treatment at scene and during transport; in one case no form of initial treatment could help because of severe abdominal injuries; mismanagement in transit no doubt was a factor in the other three deaths.

Hypoxia: With efficient patient positioning, use of sucker and oral airways much of the prolonged intermittent hypoxia could be avoided and some deaths from gross cerebral oedema with compression prevented.

#### Recommendations

Ambulance training: There should be emphasis on unconscious patients, especially those with head injuries; positioning patients and insertion of oral airways. A definite policy should be adopted toward the use of splints. More could be done in controlling severe bleeding by manual pressure. Assessment of injuries would be improved by better training. More training in use of equipment is needed.

Communications: Radio link between hospital emergency departments and city ambulance service.

Ambulances: Improved vehicle design to keep litters level and allow maneuverability for attendants. In future, litters will be interchangeable with hospital emergency department litters.

Ambulance equipment: All ambulances should carry at least a triangular wooden gag, a sucker, three sizes of airways, resuscitators, and ratchets on ambulance stretchers to permit head-down tilt.

## HOSPITAL MOBILE ACCIDENT UNITS

S. Armitage, s.r.n., r.f.n., q.n., m.s.s. ch.

Nursing Times, Vol. 63, Nov. 10, 1967, pp.1514-15

Macmillan Ltd., Little Essex St., London WC2, England

A departmental charge nurse at Huddersfield Royal Infirmary in England outlines the emergency care of accident casualties, including the use of mobile units to give on-the-spot treatment and maintain vital therapy during transit to the hospital.

The mobile unit functions from the

first-line hospital, the facility providing emergency service for the area; secondline, or supporting, hospitals in the area provide overflow space and staff if needed. The police incident officer informs the hospital switchboard operator of the place and type of accident and estimated casualties. The hospital operator informs the surgeon of the week, accident department chief, head nurse, resident surgical officer, porters who will load equipment, then clears lines as far as possible. The accident department surgeon prepares the hospital to receive casualties and alerts second-line hospital; the head nurse does the same for the nursing staff.

The mobile team moves by hospital or ambulance authority vehicle. The team, headed by a surgeon, named by the surgeon of the week, includes house surgeon, anaesthetist, nursing sister, and four others from nursing staff. The surgeon in charge organizes a system of casualty clearance at the site and the nursing staff carries out treatment and supervises first aiders. The aims are to: Control haemorhage; relieve pain; treat shock; immobilize fractures; and remove casualties to hospital in order of priority.

In discussing initial treatments, the author emphasizes the importance of marking the patient's forehead with skin pencil to record type of drug and time administered, lists equipment, and advises team members to use shoulder bags while circulating on the scene.

At the hospital the resident surgical officer sorts patients into three categories: Immediate admission; admission after dressing; treatment and discharge. The third group being diverted to an outpatient hall supervised by a nursing officer.

#### EMERGENCY CARE AND TRANS-PORT OF THE INJURED

Roswell K. Brown, M.D.

Journal of the Medical Association of Georgia, Vol. 56, Nov. 1967, pp. 467-73

938 Peachtree St. NE., Atlanta, Ga. 30309

Each year there are over 10 million disabling injuries in the United States. The associate director of the American College of Surgeons Committee on Trauma Field Program presents recommendations for on-the-site and transportation emergency care to reduce and prevent this toll.

Ambulance service should be a paramedical profession like nursing. Attendants should receive sufficient salary to attract competent workers to a career. The service should be a monopoly under proper surveillance and each community should have a central dispatch center. Two qualified people should be on each emergency call and crews should be in direct communication with dispatcher and the hospital emergency department. Prehospital care should be under supervision of the emergency department of the hospital to which the patients are taken and accurate reports on each patient should be given the department by ambulance attendants. Each community should have an emergency care council composed of government, doctors, nurses, and ambulance personnel and closed meetings should be held to discuss problems, complaints, and recommendations.

The Trauma Committee's field study showed that a significant number of accidents are caused at least in part by moving ambulances. There is no convincing evidence that lives are ever saved by vehicular speed, but fragile patients may be killed by sudden starts, stops, turns, or bounces. Certification and licensure of attendants is rarely required. Personnel qualifications and training standards are suggested, along with recommended criteria for vehicles and a revised list of equipment is given.

The field study also showed that communications systems vary greatly; many ambulances are not equipped with radio communications. Usually the first trained individual on the scene is a police officer. Easy and efficient communications between these officers, ambulances, and hospitals are needed. There is no uniformity of ambulance dispatching at present. A national ambulance telephone number is needed. The actual means of communications should be worked out in each community, coordinated regionally, statewide, and nationally.

Ambulance services lack generally accepted standards of organization and management, personnel qualifications, equipment, vehicles, and communications. These problems should be a major concern of the medical profession.

#### AMBULANCE SERVICES

EMERGENCY: EMERGENCY HEALTH SERVICES

Frang L. Mitchell, B.A., D.O., L.L.B.

Journal of American Osteopathic Association, Vol. 67, Jan. 1986, pp. 544-46 212 East Ohio St., Chicago, Ill. 60611

The odds for survival are better on the battlefield than on the home front in any emergency because fighting men receive the highest caliber of emergency rescue service and medical care while civilians severely injured in accidents or suffering from medical emergencies frequently do not.

Pointing out the inadequacies of emergency medical care in the United States, the acting chief of special health service of the Public Health Service outlines basic elements of an efficient community emergency ambulance service.

Many ambulances are operated primarily as taxicabs for prone passengers, instead of being part of a planned, coordinated medical program. About half the country's ambulances are operated by funeral directors and the remainder are operated mostly by police and fire departments, volunteers and commercial companies; few hospitals and fewer health departments provide ambulance service. In addition, many hospitals are not providing efficient and adequate emergency department services; only a handful of communities have established standards for emergency patient care.

Basic elements of an efficient community emergency ambulance services program:

- Public knowledge and education.—
  What constitutes good service and availability of local services.
- Central dispatch.—Coordinated communications between vehicles and organizations to utilize fire, police, and medical emergency equipment with maximum efficiency.
- Emergency vehicles.—Designed and equipped for safe, efficient service and inspected regularly.
- Equipment and supplies.—The American College of Surgeons basic list of minimum requirements should be

- adapted or supplemented commensurate with the training of available personnel.
- Rescue operations.—Special equipment should be available for extricating victims from fire or wreckage and for reaching remote areas.
- Training.—Opinion varies concerning minimum requirements; Committee on Trauma of American College of Surgeons is preparing a manual which may become a basic text.
- Ambulance-hospital liaison.—Vehicle communications to alert hospital on patient's condition and to receive medical advice.
- Regulations and statutes.—Communities should determine those needed to assure good service; it is vital for physicians to take an interest in the problem.

ARMY AEROMEDICAL EVACUA-TION' PROCEDURES IN VIET-NAM

Implications for Rural America Col. Spurgeon Neel, M.C., U.S.A.

JAMA, Vol 204, April 22, 1968, pp. 99-103

535 N. Dearborn St., Chicago, Ill. 60610

Historically, advances in the management of battle trauma have been applied to similar civilian problems; this discussion presents evacuation and early treatment procedures used in Vietnam which can be applied to improve civilian emergency medical care.

The mortality rate among the wounded in Vietnam medical facilities is only 2.3 percent. This accomplishment is due to: (1) Helicopter evacuation; (2) ample supplies of whole blood; (3) highly skilled organized medical teams; (4) well equipped forward hospitals; and (5) effective management of medical resources. Without helicopter service it would be difficult to exploit the other factors. No soldier is more than 35 minutes from definitive, live-saving treatment at a medical facility.

The air ambulance flies casualties—six litter or nine ambulatory patients—directly to the most appropriate medical facility. Highly trained crews make treatment decisions, initiate or continue resuscitation measures, and radio receiving hospital the time of arrival, nature of casualties, and indicated receiving arrangements.

The aviation training crash rescue system is believed to have more direct application to civilian emergency medical care. The objectives are to reach the scene as quickly as possible, suppress postcrash fires to recover personnel, initiate emergency medical treatment, and evacuate patients to appropriate medical treatment centers. These helicopters are equipped with firefighting supplies, personnel hoists, special tools to extricate casualties. protective clothing for crew, and resuscitation equipment; Army radio-telephone communications connect crew with all emergency centers and hospitals. These units have evacuated scores of highway accident victims near U.S. military posts.

Helicopters are uniquely suited for:

1. Automatic transportation from accident site to hospital.

- 2. Reliable service.
- 3. Hoist pickups on land or sea.
- 4. Coverage of isolated and metropolitan areas.
- Transportation to most suitable rather than nearest medical facility.
- Efficient obstacle crossing—distance, natural barriers, traffic.
- 7. Hoist removal of disabled vehicle to extricate victim.
- 8. Freeing physicians from rescue operation to function at hospital.
- 9. Facilitating regional health services.

To minimize delay in definitive treatment: (1) Select hospitals with adequate emergency procedures; (2) construct heliports adjacent or on top of these facilities; (3) provide communications between helicopter and hospitals; (4) establish central dispatch control; and (5) integrate evacuation operations with all aspects of emergency medical system.

#### ANALYSIS OF A HOSPITAL AM-BULANCE SERVICE

Leon J. Taubenhaus; M.D., M.P.H.; John R. Kirkpatrick, M.D.

Public Health Reports, Vol. 82, Sept. 1967, pp. 823-27

Public Health Services, Lee Bldg., 6935 Wisconsin Ave., Chevy Case, Md. 20015

A study of Boston City Hospital's ambulance service during the 10-week period, December 1, 1965 to February 10, 1966, revealed that the service played a minor role in the transportation of emergency patients.

The attendant's record of every third trip was analyzed; only 120 of these 432 trips were emergency. More often than not, emergency service was provided by the police department.

The service did, however, play an important role in the medical care system. It provided an essential transportation link between various medical care facilities and the city hospital—one-fourth of all trips were between hospitals—and between nursing homes and the hospital. It also enabled the general hospital to discharge patients who otherwise would have had difficulty leaving the hospital.

Patients brought to the hospital by ambulance were usually ill, including those not classified as emergency cases and twothirds of the 204 patients analyzed were admitted to the hospital.

The hospital has been regularly purchasing expensive ambulances and equipment on the assumption that it was running an emergency service, whereas the police were handling most of the traumatic emergencies. The authors feel that Boston police emergency transport system is doing a satisfactory job without expensive equipment. In their view training emergency personnel should take priority over purchase of equipment and in a municipal system where tax dollars are limited it is better to spend money to equip emergency facilities rather than ambulances.

The authors discuss the findings of the study, accompanied by tables. They believe such an analysis of a hospital ambulance service is valuable in planning for purchase of ambulance equipment and training of ambulance personnel.

# COMMUNICATIONS SYSTEMS

ALARMS AND EXCURSIONS: CRISES, COMMUNICATIONS AND CARE

Richard A. Brose, DR. P.H.

The Journal of the Kansas Medical Society, Vol. 69, Mar. 1968, pp. 96-9-113
315 West Fourth St., Topeka, Kans. 66603

This paper, by assistant professor of preventive medicine and community health at the University of Kansas Medical Center, presents a method of coordinating community efforts to achieve an adequate communication and patient flow control center for medical emergencies.

Many such emergencies are processed through existing police and fire systems, requiring police and firemen to make some kind of diagnosis, give first aid and select the treatment hospital. They are expected to make decisions before reaching the hospital that they would never be permitted to make within a hospital.

A centralized communications and dispatching system, linking ambulance and rescue services to hospitals and other emergency services (charted), should be designed to meet specific community needs. To reduce confusion and select the best services for each emergency the system should: (1) Have physicians available at all times to the center; (2) include all ambulance services, hospitals, medical groups, and others who provide emergency medical services to the community; (3) give final authority to the center to

meet the patient's immediate needs with the best available service.

## Recommendations for Routine Opera-

- Receive all emergency medical calls at single phone number, well publicized.
- Screen calls to obtain details on patients' symptoms to dispatch nearest service, give first aid instructions, and select best treatment facility.
- 3. Dispatch nearest available ambulances to scene by direct phone line to service.
- Notify other emergency services through direct communications to coordinate police, fire, and medical equipment and personnel.
- Direct destination of patients using a status board at the center which indicates available hospital space and specialized care facilities.
- 6. Notify hospital of pending arrival, condition, and special problems.

#### Expansion of System for Disasters

- Triage (sorting) at the scene.—A medical and paramedical team in radio contact with center, dispatched to the scene.
- Special assistance.—If necessary, packaged disaster hospitals, blood supplies, civil defense, and public health service assistance coordinated into flow of emergency services.
- Coordinated effort.—Any request for assistance from any source can be processed through the fire, police, and medical dispatchers.

#### Advantages

 Physicians make decisions on patient care, transportation, and choice of hospital without strain on community) medical manpower.

- 2. Timelag between onset and treatment reduced.
- Disproportionate use of emergency vehicles and hospital emergency departments avoided.
- System can be rapidly expanded for disasters.

#### TORONTO'S UNIQUE AMBU-LANCE DISPATCH CENTRE

Canadian Hospital, Vol. 45, Apr. 1968, pp. 46-7

Canadian Hospital Association, 25 Imperial St. W, Toronto 7, Ontario, Canada

Metro Toronto Emergency Ambulance Dispatch Centre, established January 1967, handled about 45,000 calls during its first year, 88 percent for emergency ambulance service.

The switchboard has three 60-line call directors, wired independently to eliminate the possibility of all three being out of service at once. In case of power failure the call directors switch over immediately to an emergency standby battery powered system. All circuits are routed to the Hudson Central Office where they are tagged too priority.

A large electronic map indicates by flashing red and green lights the location of all private and public ambulances in the metro area at all times day and night and the location of all main hospitals. Dispatchers are in two-way direct communication with private and public ambulances, police departments, hospital emergency wards, fire departments, the Ontario Motor League, coroner's office, and all school swimming pools in the city.

# HOSPITAL EMERGENCY SERVICES

CLOSEST CARE NOT ALWAYS
THE BEST CARE

Medical World News, Vol. 9, Mar. 15, 1968, p. 36.

299 Park Ave., New York, N.Y. 10017

In Chicago, every hospital with surgical facilities is required to operate an emergency room and police and firemen are instructed to take emergency cases to the nearest hospital. But only a few of the 150 area hospitals are able to give good emergency care.

Many trauma patients are moved twice—to the nearest, then to a larger hospital with better facilities. Economic and racial factors are thought to play a part in the transfers. If a hospital decides the bill will not be paid, or payment may be delayed by welfare department procedures, a patient may be moved to a large public hospital.

Citing the much publicized Sosa case—in which a police squad car led a couple and their infant, just born in rush hour traffic, to the nearest hospital only to be turned away by a staff physician who never so much as glanced at the mother and newborn child—this report says the bizarre developments of the case underscore the problem of inadequate emergency rooms.

Cook County Hospital administrator says many transfers are made under unsafe conditions and it is not uncommon for patients to arrive unannounced in severe shock, with fractures unsplinted and fluid infusions unattended. The chief of surgery has complained publicly about such handling.

In a letter to a Chicago paper he cited the case of an accident victim who was transferred to Cook County before X-rays were taken even though a house physician at the first hospital had diagnosed a thigh fracture and possible fracture of the jaw. The patient arrived at Cook County in deep shock 2 hours after the accident and an abdominal puncture revealed the peritoneal cavity was filled with blood from a ruptured liver. The patient died on the operating table.

Blaming the death on the lack of a citywide plan for the care of the acutely injured, Dr. Freeark noted, "It is a sad commentary on urban progress when an accident victim in Chicago must wait 2 hours for what the soldier in the jungles of Vietnam receives in 20 minutes."

A newspaper columnist summed up the public's attitude: "Now that the doctors seem to be solving the problem of transplant rejections, they had better get to work on the patient rejection problem."

#### A TRAUMA UNIT FOR YOUR HOS-PITAL?

Robert J. Freeark, м.D.

Hospital Practice, Vol. 3, Mar. 1968, pp. 48-53

485 Madison Ave., New York, N.Y. 10022

The director of surgery at Cook County Hospital in Chicago discusses the establishment of the Nation's first trauma unit as a result of problems arising from diagnosis and treatment of multiple injury patients. Cook County Trauma Center has cared for about 12,000 patients in its first 2 years and it is estimated that traumaconnected mortality has been lowered by over one-third in that time.

Previously, multiple injury patients often were admitted to specialty wards determined by the injury which appeared most urgent and many diagnostic errors occurred in establishing such priorities. Moreover, "secondary" needs might be comparatively neglected or even overlooked. The tremendous volume of accident patients also influenced the decision: centralization of trauma facilities and personnel is more efficient for handling the load, sometimes as high as 50 patients in 24 hours, and the accident workload places the hospital in an excellent position to conduct research on trauma.

Costing approximately \$100,000 to install, the center consists of four areas:

- 1. Admitting section.—Four cubicles where senior and junior personnel and consultants examine patients—residents from nine surgical specialties are on duty at all times in the hospital. All accident injuries are sent to trauma center from the emergency room. Single injuries in generally good condition are transferred to appropriate specialty services. Multiple injuries, shock, the elderly suffering illnesses, and those requiring intensive care are kept in trauma center.
- Close observation.—Two beds for most urgent cases requiring constant intensive care by several nurses.

- Main ward.—Nineteen beds for care similar to that in a recovery room or intensive care unit.
- Isolation.—One bed for intensive care and special studies of most critically ill where significant parameters are continually and automatically monitored.

An adjacent diagnostic laboratory routinely runs on a round-the-clock basis, measurements for blood gases, blood volume determinations by radioisotope technique, emergency chemistries for clotting disorders, and evaluation of various organ functions.

Surgery, required by 10 percent, is performed in main operating room by trauma center surgeons who diagnosed and initiated treatment and they supervise post-operative care. This unified care is effective in identifying postoperative problems. Patients requiring diagnostic study remain in the center while those who recover satisfactorily without surgery are moved to general wards. The average stay is 72 hours, average weekly caseload 125.

Three full-time surgeons are responsible for planning and supervision and the center is staffed by a general surgical resident, four residents and three interns.

The center has the highest nurse-patient ratio in the hospital. The 22 nurses accompany physicians on daily rounds; attend weekly meetings on trauma management; are trained in head injuries, traction management, controlling intrathoracic bleeding, recognition of ruptured spleen; and are permitted to start intravenous fluids, perform intubations, and assist directly in minor surgical procedures.

The research program is closely allied to clinical activities. Studies conducted on patients with multiple injuries and in shock, using electronic equipment to evaluate cardiac function and blood flow to assess the effect of various therapies on cardiac output, are valuable in determining treatment. Angiographic studies on over 100 patients with abdominal injuries show that when X-rays are negative, damage to visceral organs is unlikely; when positive, they greatly shorten observation period and prevent delay in treatment.

Dr. Freeark believes that any hospital with 500 beds or more and high accident admissions should consider a trauma center, especially if the hospital trains residents in various trauma-related surgical specialties. To insure cooperation among surgical specialists the general surgeon should be in charge and exercise diplomacy in matters of consultation. At Cook County consultation is mandatory if there is the slightist possibility that a specialist's services may be needed, an action of great educational value to all.

Future needs are:

- A followup clinic staffed by trauma center personnel.
- Several trauma centers in large hospitals strategically placed in the Chicago area.
- 3. Helicopter ambulance service for rush hour accidents. Cook County has used such service to bring patients from the accident to and from another hospital, using the heliport adjacent to the hospital. Helicopters also can rush equipment and personnel to the scene of mass casualties where the staff can decide who needs air transportation, ground vehicles, or on-the-spot treatment.

\*WHICH EMERGENCY ROOM SHOULD YOU GO TO?

Madeleine Lundberg

Washingtonian, Vol. 4, Oct. 1968, pp. 49-59

1218 Connecticut Ave. NW., Washington, D.C. 20036

There are 22 civilian hospitals with 24-hour emergency room service in the Washington, D.C. area. This report rates the service on the basis of extensive interviews with administrators, physicians, and other staff; personal observations and a questionnaire which only two hospitals declined to answer. Five emergency rooms rated very good; eight, good; one, adequate; five, less than adequate; and one should be closed for the good health of the community.

None will be able to care for the ever increasing number of patients without major expansion. Emergency rooms handle twice as many patients as 5 years ago, but many are not true emergencies. The causes of this dilemma are cited as: (1) The disappearance of the family general practitioner; (2) a growing public awareness of medical problems and consciousness of advances in medicine; (3) hospital insurance; (4) people are hospital-oriented for on-the-spot care; (5) psychosomatic illnesses; and (6) the hospital is often the only medical aid station known to low income people.

Most physicians and administrators agree that public education is not the solution. "The public sets the pattern and we have to mold ourselves to it."—"If the patient thinks it's an emergency, it is."

One hospital has successfully eliminated the emergency room's outpatient clinic case load by initiating an evening walk-in clinic that is open "as long as needed," which usually means 10-11 p.m. Another wants a triage (sorting) team of doctors and nurses to screen people when they arrive and send them to the emergency room for immediate treatment or to the outpatient clinic. "It is done during disasters, we should be able to institute it as a rule."

Although every doctor with emergency department experience agreed that the vast majority (over 99 percent) of emergency room cases can very well travel a few miles further, a few violently disagreed with the idea of consolidating the area's 22 emergency rooms into 12-15 first-class emergency facilities.

A good emergency room should have adequate and properly designed space, sufficient equipment, laboratory and special care services, and a staff of permanent employees. It must have specialists in the building available at all times: A general surgeon, internist, anesthesiologist, radiologist, possibly a neurosurgeon and, if appropriate to the hospital, an obstetriciangynecologist and pediatrician.

Minimal fees ranging from \$5 to \$15 are no indication of the quality of care. The median actual cost for a visit to an emergency room is considered to be \$18. Approximately 30 percent of bills are written off and all hospitals lose money except one, which will "break even."

The report concludes that patients probably receive the best medical care in university or teaching hospitals. Each Washington area hospital is discussed and charted.

#### THE CARE OF THE INJURED

The Development and Purpose of an Accident Hospital

William Gissane, c.B.E., F.R.C.s.

Annals of the Royal College of Surgeons of England, Vol. 41., Oct. 1967, pp. 335-43

Lincoln's Inn Fields, London WC2, England

A member of the Institute of Accident Surgery in England traces the 25-year history of the Birmingham Accident Hospital as a treatment and research center and the need for future major accident units.

The establishment of the hospital in 1941 for better treatment of industrial accidents was fortunate because the wartime unskilled labor increased accidents 30 percent, the rehabilitation of the injured was vital to the war effort, and, in addition, there were many civilian air raid casualties.

A senior staff of general surgeons attended the admission of all injured and facilities were developed to treat all types and severity of injury in two ground-floor admission departments—one for the major daily patient load of lesser injured and an adjacent intensive-care unit for major injuries both with diagnostic and treatment sections. Rehabilitation and therapy services were located immediately above. Laboratories, research, major operating suites, and inpatient wards followed normal hospital arrangements, but the tempo of their services met that of the accident admissions.

The Medical Research Council, in association with the hospital, has conducted research investigations of wound

infections, burn infections, industrial injuries, occupational skin conditions, the causes and prevention of domestic injuries, and the nature and causes of traffic injuries. In 1943, the hospital set up a rehabilitation workshop in the Austin Motor Co. factory, supervised by its medical officer and visited biweekly for 7 years by hospital surgeons—a forerunner of workshops set up on a national scale by the Ministry of Labor.

In 1947 the hospital was receiving 28,000 injured a year. To provide 24-hour service three full surgical teams were essential, each headed by two consultant surgeons with general training, and another surgical team for the burns unit. The author points out the value of the teams' war surgery experience and the need for applying war medical knowledge to similar civilian injuries in today's hospitals rather than continuing services almost exclusively for the care of slower moving pathological conditions.

Further advances were made by surgeon Alan Ruscoe Clarke, collaborating with the Medical Research Council unit, in establishing a method of quick clinical assessments of the degrees of blood loss during injuries, the part played by early and adequate blood replacement, and the necessity of early surgery as part of resuscitation. Over the years the hospital staff has contributed to the prevention of accidents, prevention of injuries, and new methods of treatment.

The author believes that other heavily populated cities should have such centers; modern surgery must be supported by high-level ancillary services and expensive equipment on a 24-hour basis; and that large, modern, comprehensive, fully equipped, and staffed facilities must include self-contained major accident units.

# CLINICAL MANAGEMENT OF CASUALTIES

THE MANAGEMENT OF MULTI-PLE INJURY PATIENTS

Walter F. Pizzi, M.D.

The Journal of Trauma, Vol. 8, Jan. 1968, pp. 91–103

Williams & Wilkins Co., 428 E. Preston St., Baltimore, Md. 21202

A surgeon at Beekman-Downtown Hospital in New York City discusses the treatment of four multiple injury patients from an automobile accident, emphasizing on-the-scene resuscitation by trained attendants; rapid, direct communication with the hospital for efficient emergency care; the team approach in patient care and classification system.

Six categories of multiple injuries are charted: Multiple tissue trauma; trunk fractures and genito-urinary tract trauma with additional injury; central nervous system trauma with obvious additional injury; central nervous system trauma with hidden additional injury; embarrassment of respiration and other trauma; ruptured abdominal viscus with additional injury.

Beekman's ambulance attendants perform resuscitation with the "Minute-Man" positive-negative respirator which has suction attachment and portable external cardiac massage apparatus. Twoway radio system enables attendants to communicate directly with hospital to alert emergency department and medical teams, saving at least 15 critical minutes. Eventually it may enable attendants to receive doctor's instructions on use of electrocardiograph and defibrillator.

The emergency room can accommodate seven patients on examining tables and 20 additional on stretchers. A multiple injury patient is not moved from the time he is put on a stretcher at the accident scene until he is placed on the operating table-preventing further injury. The ambulance stretcher is placed on a wheeled stretcher at the emergency entrance. Interns and residents are trained to check for possible multiple injuries, particularly in the presence of one obvious complaint and if possibility is noted, a surgeon is summoned immediately. The emergency team consists of an attending surgeon and two assistants. Each specialist called in on the case takes into consideration the problems of his associates as well as those of his specialty, which sometimes calls for delaying or varying treatment to accommodate another aspect of the case. Some considerations from the standpoint of surgery, internal medicine, orthopedics, urology, thoracic surgery, neurosurgery, anesthesia are noted.

## EARLY MANAGEMENT OF COLD INJURIES IN MASS DISASTER

W. J. Connelly, L.R.C.P. and s., L.M.C.C., D.P.H., D.C.H.; F. C. Pace, M.D.; Wilma G. Stewart, M.D.

Medical Service Journal, Canada; Vol. 23, May 1967, pp. 779-85

Veterans Affairs Bldg., Ottawa, Ontario, Canada

Consultant to the Division of Emergency Health Services, Department of National Health and Welfare, Ottawa, discusses cold injuries likely to occur in a

mass disaster during the winter: accidental hypothermia and frostbite.

When both occur in a patient, treatment of hypothermia—lowering of body temperature by cold exposure—takes priority as the most urgent threat to survival. Additional traumatic injuries may contribute to the development of hypothermia because of the patient's inability to seek shelter, immobility, or blood loss.

Canadian Emergency Health Services provides for three echelons of treatment in mass disaster: (1) Casualty collecting unit—first aid and evacuation control at rescue site; (2) advanced treatment center—casualty sorting for treatment priorities and emergency life-saving care; (3) hospital, existing and emergency. Management of cold injuries at these three echelons is given in some detail. Emergency management at the first two are summarized here.

At casualty collecting unit.-Moderate hypothermia symptoms include abnormal behavior, slowing, stumbling, weakness, repeated falling, confusion, inability to walk. Prevent further heat loss with blankets or additional clothing, activity such as walking, hot drinks if available. Avoid administration of all drugs since some may cause further heat loss. Evacuate in closed vehicle, if possible, on delayed priority to treatment center. In severe hypothermia patient is stuporous or unconscious and skin is cold. If there is doubt that patient is alive, evacuate because life may be present and recovery with professional care is possible. Insulate with blankets, treat concomitant injuries by first aid, evacuate on urgent priority in closed vehicle to treatment center. Frostbite: flesh is white and hard at first, then red and mottled, numbness present.

Gently remove clothing, cover frozen part with large dressing and evacuate on delayed priority.

At advanced treatment center.-Moderate hypothermia: Closely supervise for mental impairment, keep in warm environment, observe and record on casualty card; shivering-usually favorable; blood pressure-rising to normal favorable; rectal temperature, hourly if possible. Drugs and I.V. fluids not given unless necessary for coexisting injuries. Severe hypothermia: Immediate professional assessment, urgent resuscitative measures, replace arrival blanket with warm one, determine and record blood pressure and rectal temperature, evacuate to hospital on urgent priority. Frostbite: Professional evaluation on removal of dressing; thaw by immersion in water 18-35° C. (65-95° F.) for 30 minutes unless evacuation is immediately possible; apply burn dressing; morphine for pain unless contra-indicated by hypothermia or other conditions, evacuate to hospital.

## CIVILIAN BATTLE CASUALTIES IN SOUTH VIETNAM

H. A. F. Dudley; R. J. Knight; J. C. Mc-Neur; D. S. Rosengarten

British Journal of Surgery, Vol. 55, May 1968, pp. 332-40 John Wright & Sons Ltd., Bristol, England

This paper recounts the experiences of a civilian team of three surgeons and an anaesthetist from Albert Hospital in Melbourne, Australia, engaged in the treatmeat of nonmilitary battle casualties over a period of 3 months. Increasing numbers

of surgeons may face such casualties, the authors say, in other local wars or in "broken-back" warfare following atomic or thermonuclear attack.

Civilian casualties constituted 40–90 percent of the surgical caseload. Many were injured in paddyfields or along waterways where human and animal excreta were common; under such circumstances, speedy evacuation, early treatment, and use of massive chemotherapy probably accounted for the lack of gas gangrene or tetanus.

Modern lightweight weapons with high rate of fire used at short range produces trivial entry wounds, but considerable internal damage and exit wounds. The bullet usually disintegrates and it is rare to find it even when the exit wound is absent. Individuals may receive considerable numbers of wounds, posing a problem in priorities of resuscitation and treatment. Peppering by small fragments may be extremely high and deep penetration may have occurred in a number of places. Greater care than usual is necessary in assessing wounds that may have penetarted body cavities; small fragments may skim through muscle layers leaving little trace. Severe multiple peppering may significantly contribute to blood loss and tissue injury and must, particularly in children, be taken into consideration when quantitating resuscitation.

Napalm dropped from aircraft is an all-or-nothing weapon, so it is rare to see such burns. White phosphorous grenades produce burns characterized by extensive deep damage to hands, arms, and face. Shock is not usually a problem if patients reach the hospital.

Civilians and paramilitary personnel

evacuated quickly by helicopter present paradoxical problems. First, the present hospitals with very limited resources are filled with well-nigh irremediably injured patients. Second, large unsorted batches of patients literally descend directly upon a surgical team which under more conventional disaster situations would be protected by triage at various levels.

These observations, taken from detailed discussion illustrated by cases, are followed by explicit information on resuscitation, anaesthesia, and methods of treatment used, including a table of 31 cases involving thoracic, abdominal, and combined injuries.

#### MASS CASUALTY HANDLING ABOARD CARRIER—PART IV

Capt. Jefferson W. Paslay M.C., U.S.N.; LCDR James B. Green, Jr. M.C., U.S.N.R.; Lt. E. W. Hunt, M.C., U.S.N.; Lt. J. B. Lench, M.C., U.S.N.

United States Navy Medical News Letter, Vol. 51, June 21, 1968, pp. 21-3 Bureau of Medicine and Surgery, Dept. of the Navy, Washington, D.C. 20390

A fire on an attack aircraft carrier was extinguished in 3 or 4 minutes, but crew members suffered burns, smoke inhalation and heat exhaustion. Two burn cases walked to sick bay and seven were carried on stretchers. They had second degree burns over 15 to 85 percent of their bodies. Sixteen with heat exhaustion and an estimated 50 suffering smoke inhalation were taken to the after deck to prevent congestion and confusion in sick bay.

Two flight surgeons, the senior medical officer and general surgeon, who per-

formed triage, met the first casualties and wrote this report. A medical officer and corpsmen cared for the four critical cases; the dental officer, corpsmen, and dental technicians were assigned to others.

Treatment: Remaining clothing removed; body surface burns estimated by the "Rule of Nines." Morphine given intervenously and intramuscularly. Venous cutdown to administer replacement fluids was required in two patients. Fluid consisted of lactated Ringer's solution and some received one or two units of human albumin. Foley indwelling catheters were inserted in those with 50 percent or more burns. Burns were cleaned with Phisohex®, surgically debrided as necessary, and dressed with Nitrofurazone® ointment, sterile 4 x 4 pads and sterile Kerlix® bandage; .5 cc. tetanus toxoid given intramuscularly. All had face burns requiring close observation for respiratory distress. Neosporin® ophthalmic ointment placed in eyes.

Heat exhaustion patients were allowed to rest with applied ice packs and water and NaCl tablets were given. Smoke inhalation victims, supervised by a flight surgeon with anesthesia training, received oxygen by face masks and were encouraged to cough.

Seven hours after the accident, burn cases were evacuated to an Army hospital on stretchers secured to the deck of a C2A aircraft, accompanied by a flight surgeon and two corpsmen.

Discussion and Recommodations: Although burn treatment with Nitrofurazone® ointment is considered inferior to use of 5-percent continuous AgNO3 dressing or 10 percent Sulfamylon® cream, the latter was not available and the ship's laboratory had no facilities for per-

forming serum electrolyte determinations making it unwise to employ AgNO3. Sufficient Ringer's lactated solution was stocked, but Nitrofurazone® ointment was depleted when the last dressing was applied. If facilities for serum electrolytes had been available, the use of AgNO3 solution would have been preferred and Sulfamylon® might prove even better on an aircraft carrier.

Three patients died later, but loss of life would have been much worse without prompt treatment aboard ship. Many of the staff had never been involved in the care of serious burns and their efficiency was due in large part to a lecture series on mass casualty care, including care of burns, given by a surgeon for corpsmen, dental officers, and technicians.

#### MASS CASUALTY CARE

A NEW CLASSIFICATION SYSTEM FOR DISASTER CASUALTIES

William S. Moore, M.D.

Hospitals—J.A.H.A., Vol. 7, Feb. 16, 1967, pp. 66-9-72 840 N. Lake Shore Dr., Chicago, Ill. 60611

As part of the Public Health Service supported "Planning Community Health Resources for Disasters" project conducted by the Texas Hospital Association, the author presents a disaster casualty classification system designed to maximize effectiveness of medical care given the wounded and those suffering from naturally occurring illnesses and conditions.

With due consideration for expected mortality, resource availability—includ-

ing professional manpower—time lapse between injury, and treatment, the author's nine classes of casualties are based on the mandatory relationship between anatomical description or standard diagnosis and the timeliness of necessary care.

Classes of Casualties

- 1. Destruction of vital systems.
- 2. Readily correctable damage to a vital system.
- Correctable damage to a vital system; however, survival depends upon timely emergency medical care.
- Effectiveness of medical care is doubtful, or extensive care is required too early to be available.
- Medical care is required, but may be delayed indefinitely without significant increase in mortality.
- Medical care is required, but delay will significantly increase mortality.
- 7. Survival is expected with minimum medical care
- Survival is expected with minimum medical care, but some assistance is required because of disability resulting from the wound; noneffective because of facial, hand, or foot injuries.
- 9. No significant wounds.

Sorting, or triage, requirements presented for the nine classifications are: Class 1—100 percent mortality; classes 2–3—immediate; class 4—expectant; classes 5–6—deferred; and classes 7–9—minimum.

The author also divides "levels of care" into lay, technical, nursing, and professional with "types of care" described as first aid, field dressing, ward, intensive, supportive, palliative, simple professional, and hospital.

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